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ENVIRONMENTAL IMPACT STATEMENT

Proposed

GRAZING MANAGEMENT PROGRAM FOR THE PRICE RIVER RESOURCE AREA, CARBON AND EMERY COUNTIES, UTAH

Prepared by

Department of the Interior
Bureau of Land Management
Price River Resource Area
September 1982

The Bureau of Land Management proposes to implement a grazing management program on 1,087,676 acres of public land in the Price River Resource Area in southeastern Utah. The objectives of the program are to improve vegetation condition and increase forage production for multiple use on a sustained yield basis. This statement assesses the environmental consequences of four alternative management programs including no action. The agency preferred alternative is the planning recommendation wherein vegetation would be managed to provide a balance between multiple use demands and resolution of resource use conflicts. The environmental consequences of each alternative are summarized in the Summary, compared in Chapter 1, and fully described in Chapter 3.

State Director
Utah State Office

For further information contact:

Leon E. Berggren
Price River Resource Area Manager
Bureau of Land Management
P. O. Drawer AB
Price, Utah 84501
(801) 637-4584

Date by which comments are due: October 31, 1982

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SUMMARY

Purpose and Need

The Bureau of Land Management (BLM) proposes the implementation of a grazing management program on public lands in the Price River Resource Area. The area includes approximately 1.7 million acres and 118 grazing allotments in Carbon, Emery, Utah, Uintah, and Duchesne Counties, Utah. Approximately 63 percent of the area is Federal land, 11 percent is State land, and 26 percent is private land.

The objective of the grazing management program is to maintain or improve the productivity of rangelands on a sustained yield basis while providing for multiple use and stabilization of the livestock industry within the EIS area. To help determine ways to meet this objective and identify significant issues in the area, the BLM held a series of scoping meetings and other contacts with agencies and individuals between 1978 and 1982. Some of the issues discussed in this EIS came from this scoping process.

Resource inventories began in 1978 showed the need for changes in the current grazing management program. The inventory indicated that ecological condition on public lands in the area is climax (excellent) on 5 percent, late seral (good) on 25 percent, mid seral (fair) on 42 percent, and early seral (poor) on 28 percent.

Significant Issues to be Addressed

As a result of the scoping process and interdisciplinary team meetings, the following issues were identified as being significant: 1. Wildlife-livestock competition, 2. Livestock-recreation conflicts, 3. The contribution of livestock grazing to Colorado River salinity, 4. Livestock distribution and its effect on range condition. Other issues were raised, but were determined to be insignificant or beyond the scope of this EIS.

Selective Management Categories

The allotments in the EIS area were categorized into Maintain, Improve, and Custodial categories to establish management priorities for distribution of funds and manpower. Efforts and money would be concentrated in those areas where action is most needed to resolve serious resource-use conflicts or to improve basic resources.

Alternatives Including the Proposed Action

There were four alternatives developed in planning and carried forward into the EIS. They are: A, Enhance Livestock Production; B, Planning Recommendation; C, Enhance Watershed, Wildlife, and Recreation; D, No Action. Key elements of these alternatives are summarized in Table S-1.

TABLE S-1

Summary of Forage Allocation, Management Features, and Vegetation Manipulation for Alternatives

Management Features	Alternatives: A. Enhance Livestock Production	B. Planning Recommendation	C. Enhance Watershed, Wildlife & Recreation	D. No Action	Active Preference	Average Licensed Use
Livestock Forage Allocation						
Cattle AMs	39,435	36,074	19,851	45,076	45,076	30,306
Sheep AMs	172,867	7,696	5,631	40,955	40,955	6,417
Wildlife Forage Availability					Present Wildlife Demand	
Deer AMs	48,611	175,481	177,020	133,526	128,137	
Antelope AMs	3,381	77,900	74,722	63,396	5,196	
Elk AMs	2,661	27,658	27,715	21,079	5,323	
Desert Bighorn Sheep AMs	173	13,179	17,428	16,983	180	
Rocky Mountain Sheep AMs	673	13,478	14,234	8,490	636	
Moose AMs	181	1,396	1,471	1,353	96	
Wild Horse AMs	300	489	839	347	300	
Allotments with Season of Use Changes	90	51	90	0		
Number of Allotment Boundary Changes	9	9	9	0		
Number of Mitigating Livestock Grazing Restrictions	0	8	10	2		
Vegetation Manipulations						
Acres Chained	47,158	0	0	0		
Acres Chain and Seed	21,174	30,774	0	0		
Acres Herbicide Spray	6,746	625	0	0		
Acres Prescribed Burn	1,150	6,036	0	0		
Acres Plow and Seed	3,098	1,316	0	0		
Total Acres	79,326	38,751	0	0		
Predicted Cattle AMs Gained	10,192	7,032	0	0		

A, Enhance Livestock Production. The objective of this alternative is to maximize the production of livestock forage on public lands on a sustained yield basis. The enhancement of watershed, wildlife, and outdoor recreation is secondary to livestock production. Changes in livestock season of use are proposed on all categories of allotments to favor vegetative production. No livestock grazing restrictions to avoid conflict with other uses are proposed, and wildlife introductions would be allowed only if there would be no adverse impact to livestock. Allotment boundary changes are proposed for better management and monitoring studies would be initiated. Proposed forage allocation and vegetation manipulation are shown in Table S-1.

B, Planning Recommendation. The objective of this alternative is to provide livestock forage on a sustained yield basis without causing undue degradation of other resource values or uses. Season of use changes are proposed on I Category allotments only. Wildlife introductions would be allowed, and allotment boundary changes would be as proposed in Alternative A. Livestock grazing restrictions are proposed to avoid or mitigate conflicts with wildlife, watershed, and recreation use. Monitoring studies are also proposed. Proposed forage allocation and vegetation manipulation are shown in Table S-1.

C, Enhance Watershed, Wildlife, and Recreation. The objective of this alternative is to use reduced or modified livestock grazing to enhance watershed values, wildlife productivity, and outdoor recreation user's experience. Season of use and allotment boundary changes are the same as Alternative A. Wildlife introductions are allowed, and livestock grazing restrictions are proposed to benefit watershed, wildlife, and recreation use. Monitoring studies are also proposed. Proposed forage allocation is shown in Table S-1. No vegetation manipulation for the benefit of livestock is proposed.

D, No Action. The objective of this alternative is to maintain the status quo and not disrupt current livestock operations. Season of use, forage allocation, and kind of livestock would continue as presently authorized. For a worst-case analysis, active preference is considered as present authorized allocation. No new studies, monitoring, range developments, or vegetation manipulation projects would be done. Existing studies and facilities would be maintained. Present forage allocation (active preference) and average licensed use are shown in Table S-1.

Mitigating measures in the form of standard operating procedures are incorporated into each alternative to avoid or mitigate some adverse impacts. The allotments have been categorized into selective management categories Maintain, Improve, and Custodial for prioritization of management actions and funds. A monitoring program is also proposed to determine the results of management actions that are implemented.

Environmental Consequences

The environmental consequences of implementing the alternatives have been analyzed by an interdisciplinary team, and their analysis documented in the EIS. The major measurable impacts of the alternatives are summarized in Table S-2. The team did not identify any significant adverse or beneficial impacts to climate, air quality, topography, geology, minerals, cultural resources, visual resources, wilderness, threatened or endangered species, or urban land use, that would result from implementation of any of the alternatives. A brief account of the impacts by resource follows.

Vegetation

Vegetation would generally improve under all alternatives except Alternative D. Some high use areas such as riparian and wet meadow would continue to decline especially under Alternative A where no livestock grazing restrictions are proposed. Vigor and production would increase and vegetation manipulation projects proposed in Alternatives A and B would further increase production.

Livestock Grazing

The use of forage by livestock would increase from the current average licensed use in all alternatives except Alternative C where significant reductions would occur. Season of use changes in all alternatives except D, No Action would alter some livestock operations and increase operating costs. The development of grazing systems as proposed in Alternatives A and B would also cause changes in current operations.

Wildlife

Big game populations would generally decrease under Alternative A except for moose which would not change. The big game populations would generally increase under Alternatives B, C, and D; however, on some herd units reductions would be necessary to protect critical winter ranges. Alternatives B and C propose livestock grazing restrictions to favor wildlife, and these would reduce competition from livestock and enhance big game habitat. Sage grouse habitat and productivity would generally decline under all alternatives except Alternative C.

The current degradation of aquatic habitat by livestock grazing use would continue if Alternatives A or D were implemented. Decreased fishery production and reduction of habitat would result. Under Alternatives B and C habitat quality would improve and habitat would expand resulting in increased fishery production.

Watershed

Watershed conditions would decline under Alternatives A and D, remain static under Alternative B and improve under Alternative D. Water consumption

Table S-2

Summary of Environmental Consequences

	Changes From Existing Situation[a]							
Resource	Alternative A		Alternative B		Alternative C		Alternative D[b]	
Vegetation								
Ecological Condition	Improve		Improve		Improve		Decline	
Livestock Grazing								
Allocation:								
Cattle AMs	Increase	9,129	Increase	5,768	Decrease	10,455	Increase	14,770
Sheep AMs	Increase	166,450	Increase	1,279	Decrease	786	Increase	34,538
Wildlife								
Forage Available (AMs)								
Deer	Decrease	62,371	Increase	79,991	Increase	86,899	Increase	33,351
Antelope	Decrease	1,784	Increase	73,634	Increase	72,483	Increase	54,315
Elk	Decrease	2,662	Increase	22,335	Increase	22,392	Increase	15,576
Moose	Increase	85	Increase	1,300	Increase	1,375	Increase	1,257
Desert Bighorn	Decrease	7	Increase	12,999	Increase	17,248	Increase	16,803
Rocky Mtn. Bighorn	Increase	37	Increase	12,842	Increase	13,598	Increase	7,854
Wild Horses	No change	------	Increase	189	Increase	539	Increase	47
Watershed								
Condition Trend:	Decline		Static		Improve		Decline	
Livestock Water Consumption:	Increase	100 acre-feet	Increase	15 acre-feet	Decrease	25 acre-feet	Increase	50 acre-feet
Forest Products								
Fuelwood Available on P-J Chainings:	10,250 cords		4,616 cords		No chainings		No chainings	
Recreation								
Visitor Days:								
Hunting	Decrease	40,138	Increase	4,070	Increase	9,402	Increase	3,866
Boating[c]	Increase	2,700	Increase	2,700	Increase	2,700	Increase	2,700
Economics								
Operator Income:	Increase	$1,167,014	Decrease	$ 79,115	Decrease	$ 524,835	Decline in long term	
Ranch Value:	Decrease	120,240	Decrease	939,228	Decrease	1,937,400	No change	------
Regional Income:								
Livestock	Increase	104,000	Increase	53,000	Decrease	650,735	No change	-----
Hunting	Decrease	924,000	Increase	93,000	Increase	215,000	Increase	$ 89,000
Boating	No change	-------	No change	------	No change	--------	No change	------
Regional Jobs:	Decrease	49	Increase	9	Decrease	10	Increase	6

---

[a] Impacts based on changes from last 5 years average licensed livestock use.

[b] Impacts resulting from licensing to active preference level for livestock.

[c] Increase from 5 year average use of 32,300 to restricted use level of 35,000 visitor days annually.

by livestock would increase in all alternatives except Alternative C where livestock use would be reduced.

Forest Products

Chaining of pinyon-juniper areas as proposed in Alternatives A and B would make available additional fuelwood which could be harvested by commercial or private interests.

Recreation

Visitor days for big game hunting would increase under all alternatives except Alternative A where a significant decline in hunter days is expected. Small game hunting pressure would not change under any alternative. The increase in visitor days for hunting would result from increased wildlife populations and expansion of herds that are not presently hunted because of their current low population levels.

Boating activity on the Green River would increase slightly from the current 5-year average use to the restricted-use level imposed by the BLM.

Economics

Operator income would increase under Alternatives A and B, decrease under Alternative C, and not change initially under Alternative D. In the long term operator income would decline under Alternative D. Ranch value, based on grazing permits, would generally decrease under all alternatives. This may be offset if operators change their operations to use available sheep forage.

The effects on the regional economy from activities that would be affected by livestock grazing management are variable. Regional income generated by the livestock industry would increase under Alternatives A and B, decrease under Alternative C, and not change under Alternative D. Income from hunting would increase for all alternatives except Alternative A where it would decrease. Income from boating on the Green River is not expected to change.

The regional employment would increase slightly under Alternatives B and D, but it would decrease under Alternatives A and C due to decreases in hunting- and livestock-related jobs, respectively.

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INTRODUCTION

PURPOSE OF AND NEED FOR ACTION

The purpose of implementing a grazing management program in the Price River Resource Area (PRRA) is to maintain or improve public land resources such as soil, water, and vegetation through grazing management. The BLM is required by law (Taylor Grazing Act, 1934; Public Rangelands Improvement Act of 1978; and the Federal Land Policy and Management Act of 1976) to manage public lands ". . . in a manner that will protect the land and its resources from destruction or unnecessary injury, stabilize the livestock industry dependent on the public lands, and provide for the orderly use, improvement, development, and rehabilitation of the public lands for livestock grazing consistent with multiple use, sustained yield, environmental, economic, and other objectives . . . ." (Title 43 of the Code of Federal Regulations (CFR) Subpart 4100.2, Grazing Administration).

Resource inventories were begun in 1978 to update Unit Resource Analysis (URA) information prior to preparation of the Management Framework Plan (MFP) and the grazing management EIS. These studies showed the need for some changes in the current grazing management program in order to improve forage condition in the PRRA. Surveys indicate that ecological condition on public lands in the area is climax (excellent) on 5 percent (about 55,000 acres), late seral (good) on 25 percent (about 268,000 acres), mid seral (fair) on 42 percent (about 463,000 acres), and early seral (poor) on 28 percent (about 302,000 acres). In addition, some changes in management of riparian areas, critical deer winter ranges, livestock distribution, and season of use were also indicated. Proposed reintroduction of big game animals into the area and an increase in the wild horse herd would require forage availability for the resultant populations. Studies have also identified approximately 61,000 acres as suitable for vegetation manipulation to achieve potential vegetative production capacity.

Alternatives to be analyzed in this EIS were developed in part from the objectives and recommendations in the MFP, and will address the identified management needs. The alternative grazing management programs and site-specific analyses are also in response to a suit filed in Federal Court in 1973 by Natural Resources Defense Council (NRDC) alleging that BLM's programmatic grazing EIS did not comply with the National Environmental Policy Act (NEPA).

LOCATION

The Price River Grazing EIS area is in southeastern central Utah; it encompasses most of Carbon County and parts of Emery, Duchesne, Uintah, and Utah Counties. The area is bounded by the Green River on the east, the Manti-LaSal National Forest on the west and the Wasatch Plateau on the north; the southwestern boundary is roughly a line drawn between the point where Highway U-24 crosses the San Rafael River and the town of Huntington

(Figure 1). The area includes the Price River, Wattis, Range Creek, and Summerville planning units. Elevations in the area range from about 4,000 feet at Green River to over 10,000 feet in the Book Cliffs. The area includes 1,725,997 acres and 118 designated grazing allotments. Land ownership is as follows:

Owner	Acres	Percent
Federal	1,087,357	63
State	185,949	11
Private	448,837	26
Other*	3,535	--
Total	1,725,997	100

* Reservoir, wildlife refuges

The distribution of these lands is shown on Plate 1 inserted in the back of this volume.

INTERRELATIONSHIPS

The proposed action and alternatives are interrelated with existing or proposed Federal, State, and private plans, policies or controls as described below.

Federal

Bureau of Land Management

The proposed grazing management plan interrelates with the River Management Plan for Desolation and Gray Canyons. This plan was completed June 1979, and Management Action No. 11 deals with recreation-livestock conflicts.

Proposed grazing management and any range improvements would also have to comply with the BLM Interim Management Policy (IMP) for the three Wilderness Study Areas (WSAs) included in the Resource Area and with the BLM Wilderness Management Policy if any of the areas are designated wilderness.

The proposed grazing management is closely interrelated with the MFP being prepared concurrently with this EIS. The alternatives analyzed in this EIS were developed in part from the MFP recommendations and objectives. The grazing management plan that develops from this EIS will be part of the MFP for this Resource Area.

The proposed grazing management on lands that are part of the Salt Lake and Vernal BLM districts interrelates with land use plans prepared by those districts. Grazing management on these lands is covered in Memorandums of Understanding (MOU) with those districts.

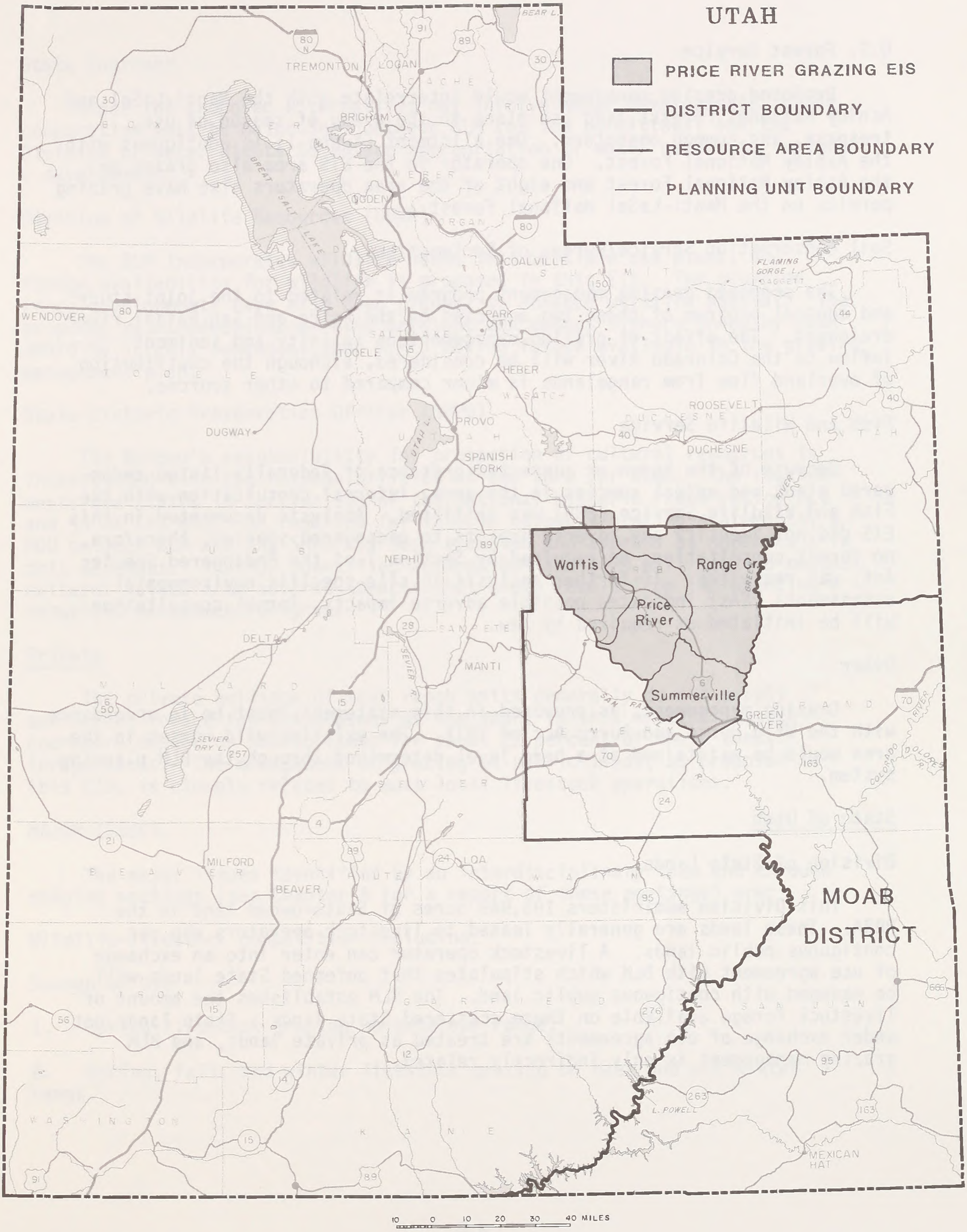


FIGURE 1

LOCATION MAP

U.S. Forest Service

Proposed grazing management would interrelate with the Manti-LaSal and Ashley National Forests land use plans in the areas of season of use, trespass, and common operators. One allotment (Kyune I) is contiguous with the Ashley National Forest. One operator in the EIS area also grazes on the Ashley National Forest and eight of the area operators also have grazing permits on the Manti-LaSal National Forest.

Soil Conservation Service/Bureau of Reclamation

The proposed grazing management program is related to the joint study and control program of these two agencies on the Price and San Rafael river drainages. The effect of grazing management on salinity and sediment inflow to the Colorado River will be considered, although the contribution of overland flow from rangelands is minor compared to other sources.

Fish and Wildlife Service

Because of the known or suspected presence of Federally listed endangered plant and animal species in the area, informal consultation with the Fish and Wildlife Service (FWS) was initiated. Analysis documented in this EIS did not identify any adverse impacts to endangered species; therefore, no formal consultation, as required by Section 7 of the Endangered Species Act, was requested. If further analysis in site-specific environmental assessments (EAs) indicates possible adverse impacts, formal consultation will be initiated as required by law.

Other

Grazing management, as proposed in this statement, must be in accordance with the Wild Horse and Burro Act of 1971. The existing wild horses in the area would be maintained at a herd level determined through the BLM planning system.

State of Utah

Division of State Lands

This Division administers 185,949 acres of State-owned land in the PRRA. These lands are generally leased to livestock operators who use contiguous public lands. A livestock operator can enter into an exchange of use agreement with BLM which stipulates that unfenced State lands will be managed with contiguous public land. The BLM establishes the amount of livestock forage available on these scattered State lands. State lands not under exchange of use agreements are treated as private lands, and BLM grazing management is only indirectly related.

State Engineer

Since the proposed alternatives may involve water developments, close cooperation must be maintained between BLM (or the permittees) and the Division of Water Rights to ensure appropriation of water needed to implement a development.

Division of Wildlife Resources (UDWR)

The BLM incorporates wildlife needs into multiple use plans, and forage availability for wildlife is proposed in this EIS. The proposed range developments have also been planned to enhance wildlife habitat. The proposed reintroductions of elk, antelope and desert bighorn sheep by UDWR would be largely dependent upon BLM's making forage available in the grazing management plan.

State Historic Preservation Officer (SHPO)

The Bureau's responsibility for protection of cultural resources is interrelated with the responsibilities of the SHPO for Utah. The requirements are stated in Section 106 of the National Historic Preservation Act and in 36 CFR 800. As required for interim category grazing statements, a MOU between BLM and the SHPO has been executed and appears as Appendix 1 in this document. The MOU identifies actions BLM and SHPO will take to protect cultural values from adverse impacts that could result from implementing a rangeland management program.

Private

The private holdings of most ranch units generally do not supply sufficient forage for all seasons of the year; in this area, livestock operators depend on public lands for about 22 percent of their annual forage needs. The management of grazing on public lands, as proposed in this EIS, is closely related to most local livestock operations.

MAJOR ISSUES

The major issues identified by an interdisciplinary team and through scoping meetings (see Chapter 4 for a report of these meetings) are:

Wildlife-livestock competition including:

Season of Use

1. Spring livestock grazing on antelope range.

2. Spring, fall, and winter livestock grazing on deer and elk winter range.

3. Grazing livestock too early on higher elevation ranges.

Kind of Stock

1. Sheep on bighorn sheep or deer winter ranges.

2. Cattle grazing on range more suited to sheep.

3. Proposed wildlife reintroductions including antelope, bighorn sheep, and elk.

Vegetation Manipulation

1. Unsuitability of present chained and seeded areas on deer winter range for use by deer.

2. Maintenance of present chained and seeded areas to benefit both livestock and deer.

3. The availability of fuelwood on chained and natural pinyon-juniper areas.

The conflict of livestock grazing with intensive recreation use on developed sites and in the Green River corridor. This includes the impact of livestock use on riparian habitat and water quality in Range Creek, Rock Creek, Price River, and the Green River.

The contribution of livestock grazing to Colorado River salinity, specifically in the Price River drainage.

Livestock distribution and its effect on range condition:

1. Overgrazing in some areas due to poor distribution of livestock resulting from slope, water availability, and access.

2. The need for range projects and facilities to achieve better distribution of livestock use.

3. Range deterioration due to continual, excessive spring grazing.

SELECTIVE MANAGEMENT CATEGORIES

This statement is prepared using the BLM Grazing Management Policy issued on March 5, 1982 (Washington Office Instruction Memo 82-292). One objective of this policy is to categorize rangelands to establish priorities for distributing available funds and personnel in a manner that will achieve cost-effective improvement of rangeland condition and production. Efforts and money would be concentrated in those areas where grazing management action is most needed to improve basic resources or resolve serious resource use conflicts. Following this policy, allotments have been grouped into one of three management categories; the categories are Maintain, Improve, and Custodial. The following standard criteria were applied, although an allotment did not have to meet all the criteria to be grouped with a category:

Maintain Category Criteria

- Present range condition is satisfactory.
- Allotments have moderate or high resource production potential, and are producing near their potential (or trend is moving in that direction).
- No serious resource-use conflict/controversy exists.
- Opportunities may exist for positive economic return from public investments.
- Present management appears satisfactory.
- Other criteria appropriate to EIS area.

Improve Category Criteria

- Present range condition is unsatisfactory.
- Allotments have moderate to high resource production potential and are producing at low to moderate levels.
- Serious resource-use conflict/controversy exists.
- Opportunities exist for positive economic return from public investments.
- Present management appears unsatisfactory.
- Other criteria appropriate to EIS area.

Custodial Category Criteria

- Present range condition is not a factor.
- Allotments have low resource production potential, and are producing near their potential.
- Limited resource-use conflicts/controversy may exist.
- Opportunities for positive economic return on public investment do not exist or are constrained by technological or economic factors.

- Present management appears satisfactory or is the only logical practice under existing resource conditions.

- Other criteria appropriate to EIS area.

Appendix 2 contains the methodology used to categorize allotments in the EIS area; and Table 1 lists the grouping of allotments by category.

Where possible, proposed actions and analyses of impacts will be addressed by category. Data for an individual allotment will be given where appropriate. Individual allotment data are available on file in the BLM Price Area Office, and these data will be used in the preparation of activity plans, for monitoring, and for decisionmaking.

It is important to keep in mind that categorization of allotments is not the proposed action or an alternative. Categorization is the result of analyzing the existing situation. Allotments may change categories as conditions change or conflicts are created or resolved.

STATEMENT PREPARATION

This statement was prepared by an interdisciplinary team of BLM personnel from the PRRA, with assistance from the BLM Moab District and Utah State offices. A list of team members with team assignment, education, and experience follows.

TABLE 1

Management Categories of Allotments

Maintain	Improve		Custodial	
Beaver Creek	Bear Canyon	Last Chance	Airport	Johnson Huff Hollow
Canyon	Bench	Little Park	Allred North	Keel
Deadman	Big Spring	Mounds	Allred South	Marakis
Huff Bench	Buckmaster	Mud Springs	Anderson	Marsing
Kyune I	Cat Canyon	North Spring	Blind Canyon	Mathis Wash
Lila Canyon	Chimney Rock Flat	Oil Well Draw	Box Flat	Max Canyon
Long Bench	Church Flat	Pine Canyon	Brown	Miller Creek
Lookoff	Clarks Valley	Pinnacle Bench	Buckskin	North Olsen Lake
Lucky Lemon Flat	Cleveland Summer	Poison Spring Bench	Calf Canyon	Oviatt
Mohrland	Coal Creek	Pole Canyon	Canal Cattle	Pace Canyon
Mudwater	Columbia	Porphyry Bench	Cleveland Winter	Patmos
North Clarks Valley	Consumers Wash	Price Canyon West	Closed to Grazing	Peterson
North Hollow	Coon Springs	Price River North	Dugout	Range Mountain
Price Canyon East	Corner	Price River South	Elmo	Rimrock
Trail Spring	Cove	River	Erramouspe	Smith
Wildcat	Cow Canyon	Rock Canyon	Fausett	Staker
	Crandall Canyon	Rock Creek	Fish Creek	Victor
	Dripping Springs	Sage Flat	Grassy Trail	Washboard
	Dry Canyon	Sheep Canyon	Green River South	Wellington
	Elliot Mountain	Soldier Canyon	Jensen	
	Fan Canyon	South Olsen Lake		
	Farnham	Spring Canyon		
	Gordon Creek	Stone Cabin		
	Green River North	Sulfur Canyon		
	Haley Canyon	Summerville		
	Hayes Wash	Trail Canyon		
	Hiawatha	Wattis		
	Humbug	Willow Creek		
	Icelander	Woodhill		
	Iriart	Woodside		
	Kimball Canyon			
	Kyune II			

LIST OF PREPARERS

Name	Team Assignment	Education	Experience
Leon E. Berggren	Project Manager	B.S. Wildlife Management; New Mexico State University	BLM, 15½ years; 3½ years Range Conservationist, 1 year Natural Resource Specialist, 2 years Wildlife Biologist, 9 years Area Manager
Daryl Trotter	Technical Coordinator	B.S. Botany, Range Science; Brigham Young University	BLM, 8 years; 1½ years Environmental Coordinator, 1 year Range Conservationist, 3½ years Planning Coordinator, 2 years Chief of Planning and Environmental Assistance
Larry Eyre	Team Leader	B.S. Botany; Brigham Young University	Utah Division of Wildlife Resources, 10 years; 3 years Conservation Officer, 7 years Editor BLM, 7 years; 3 years Writer-Editor, 4 years Environmental Coordinator
Dennis Willis	Vegetation and Livestock	B.S. Renewable Natural Resources; University of Nevada, Reno	BLM, 6 years; Range Conservationist
David Mills	Wildlife	B.S. Wildlife Management; New Mexico State University	BLM, 5 years; Wildlife Biologist
Blaine Miller	Cultural Resources	B.S. History; Weber State College M.A. Archaeology; Brigham Young University	BLM, 6 years; Archaeologist
Jim Kenna	Recreation and Wilderness	B.A. Economics; Prescott College	USFS, 5 years; Forestry Technician BLM, 2 years; Outdoor Recreation Planner
Robert Milton	Socioeconomics	M.S. Economics; Colorado State University	Colorado State University, 2 years; Research Associate BLM, 1 year; Economist
Jesse Purvis	Hydrology-Climate	B.S. Fisheries; Humboldt State M.A. Biological Sciences; Chico State	California Department of Water Resources and Department of Fish and Game, 2 years; Fishery Biologist BLM, 2 years; Hydrologist
Ruth Ann Thurston	Writer-Editor	Capital Business College	Private industry, 15 years BLM, 4 years

CHAPTER I
DESCRIPTION OF ALTERNATIVES

ITEMS COMMON TO ALL ALTERNATIVES (EXCEPT NO ACTION)

The following items are common to all alternatives except Alternative D, No Action. Any exceptions or minor modifications are noted in the description of the appropriate alternative.

Grazing Systems and Treatments

Grazing treatments are designed to improve range condition by providing rest during critical growth periods of key management species. Grazing systems are developed by combining one or more treatments with scheduled grazing. According to BLM policy, development of grazing systems takes place at the Allotment Management Plan (AMP) level in coordination and consultation with the livestock operator. This coordination and consultation will not be done until after filing of the final EIS; consequently, no specific grazing systems are proposed at this time. They will be developed as part of the AMP, and impacts analyzed in a site-specific EA.

The following treatments were proposed in MFP Step 1 and may be used to develop grazing systems in the EIS area. Treatment 1: Rest from livestock grazing for 4 consecutive years or until browse plants are established. Treatment 2: Rest from livestock grazing for 2 consecutive years. Treatment 3: Rest from livestock grazing from the spring of one year until midsummer the following year. Treatment 4: Livestock grazing from midsummer through fall. Treatment 5: Rest for 2 consecutive years until plants are established or until it is determined that a manipulation project has failed. This treatment would be applied only after a vegetation manipulation project has been completed. Treatment 6: Livestock grazing in winter. Treatment 7: No livestock grazing. Treatment 8: Spring grazing. This treatment would be applied only on crested wheatgrass seedings or on a prescription basis to reduce grass cover. It may also be combined with a treatment that would provide adequate rest to propagate key plant species.

Fences and other range improvements needed to implement grazing systems will be designed during the AMP development; consequently, they are not proposed in this document. The site-specific impacts of these projects will be analyzed in an EA covering the AMP.

Suitability for Livestock Grazing

Slopes in excess of 50 percent are considered unsuitable for grazing by domestic livestock. Forage on these slopes will not be allocated to domestic livestock. Other suitability criteria such as distance from water, erosion potential, and forage productivity will be considered in the AMP. These criteria are highly variable and should be considered at a level of detail that is beyond the scope of this document.

The slope unsuitability determination is common to all alternatives except Alternative D.

Allotment Boundary Changes

The following allotments are proposed for consolidation (see Plate number 1 for current allotment boundaries):

1. Corner with Soldier Canyon
2. Box Flat with Calf Canyon
3. Smith with Miller Creek and Canyon
4. Oviatt with Mathis Wash
5. Icelander with Fan Canyon and Columbia

The prime consideration in combining these allotments is to improve range condition and trend. All of the allotments recommended for combination have some of the following situations in common: (1) they are adjacent or in close proximity, (2) none is managed intensively, (3) the range condition is generally poor, (5) combination with other allotments would allow more efficient management, (6) problems of unauthorized use and overobligation of forage exist, and (7) most lack exterior boundary fences.

Boundary adjustments are proposed on the following allotments:

1. Cove and Woodside, those areas west of Highway 6 would be added to Coon Springs (Figure 2);

2. Elliot Mountain, that area west of Highway 6 would be added to Trail Springs;

3. Elliot Mountain, Woodside, Closed to Grazing; and Green River South, boundary changes would be as shown in Figure 2;

4. Trail Spring, Chimney Rock Flat, and Buckmaster as shown in Figure 2.

Allotment combinations and boundary adjustments are common to all alternatives except No Action. Where allocation figures are shown, they are based on existing rather than proposed boundaries. Actual allotment boundary changes would occur after consultation with the affected livestock operators.

Forage Allocations

The proposed forage allocation for each grazing animal is calculated from raw vegetation production data from the Soil Vegetation Inventory Method (SVIM) using a linear programming model. Appendix 3 contains a brief description of the model and parameters used in calculating forage allocation

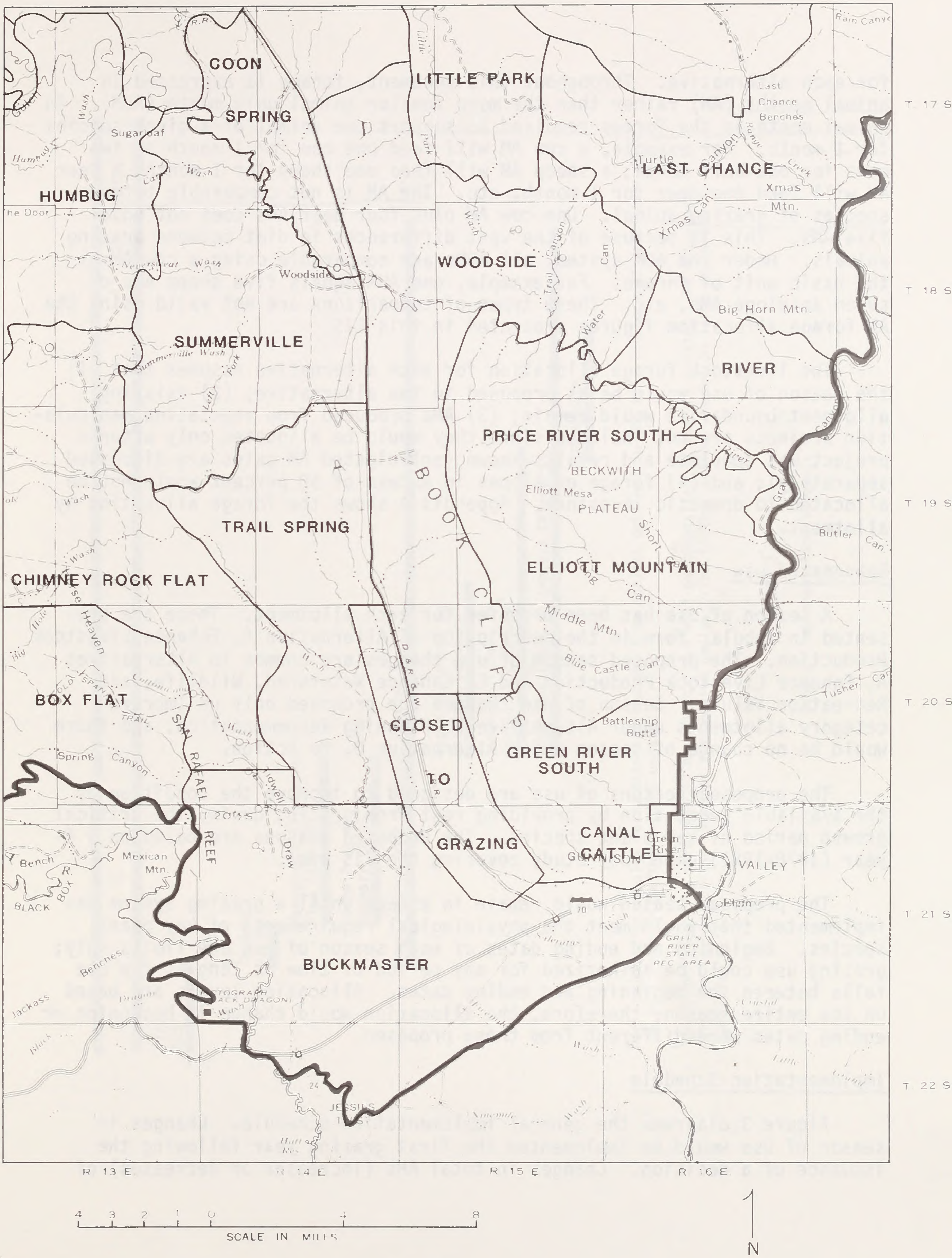


FIGURE 2
PROPOSED ALLOTMENT BOUNDARY CHANGES

for each alternative. Throughout this document, forage is expressed in animal months (AM) rather than the more familar animal unit month (AUM). An animal month is the forage required to support one animal of a given species for 1 month. For example, a cow AM will feed one cow for 1 month or two cows for one-half month; a sheep AM will feed one sheep for 1 month; a deer AM will feed one deer for 1 month, etc. The AM is not comparable between species of grazing animal. One cow AM plus four deer AMs does not equal five AMs. This is because of the vast differences in diet between grazing animals. Under the AUM system, all AUMs are comparable using a cow AM as the basic unit of forage. For example, one AUM equals five sheep AMs or seven antelope AMs, etc. These types of comparisons are not valid using the AM forage allocation figures presented in this EIS.

The livestock forage allocation for each alternative assumes that (1) the season of use would be as proposed in the alternative; (2) existing allotment boundaries would remain; (3) AMs produced from vegetation manipulation projects are not included since they would be allocated only after a project was complete and results known (anticipated AM gains are discussed separately); and (4) forage on slopes in excess of 50 percent would not be allocated to domestic livestock. Appendix 4 shows the forage allocation by allotment.

Seasons of Use

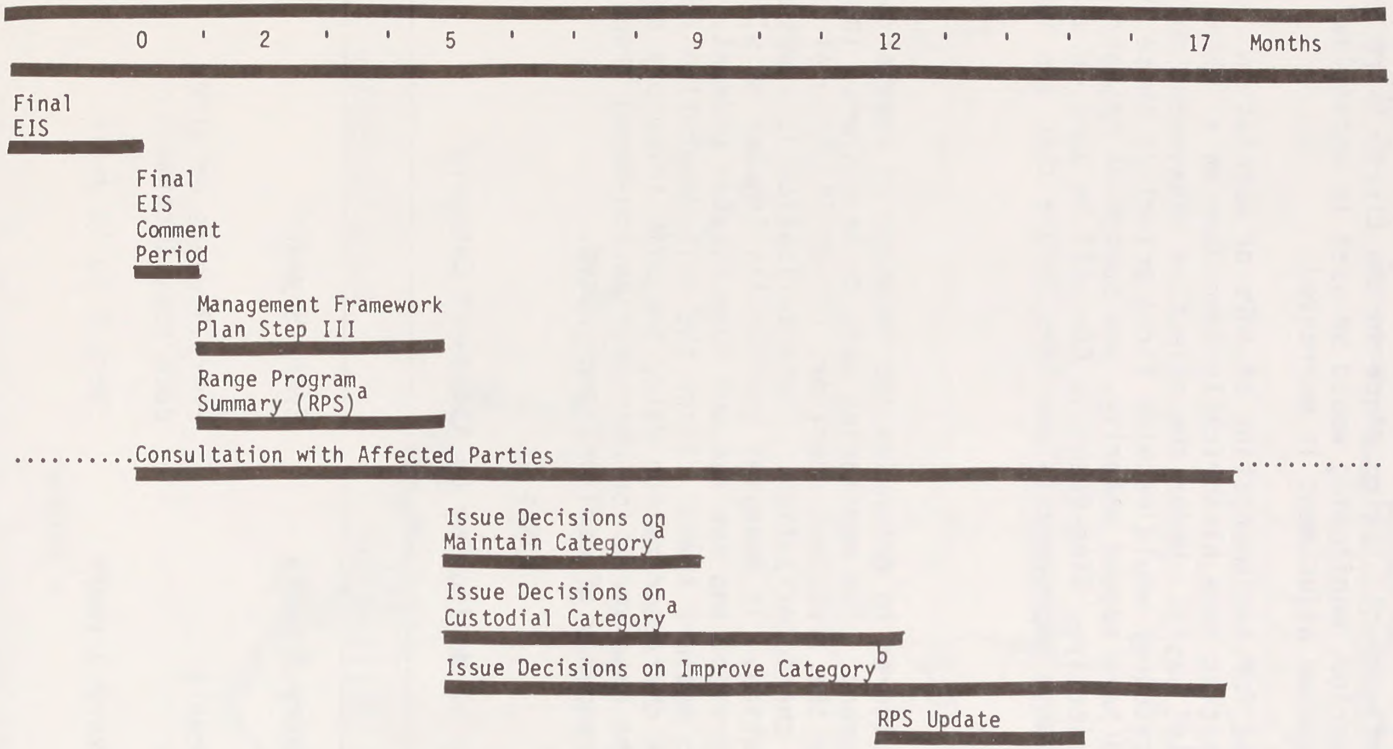
A season of use has been proposed for each allotment. These are presented in tabular form in the description of Alternative A, Enhance Livestock Production. The proposed season of use changes are common to Alternatives A, Enhance Livestock Production and C, Enhance Watershed, Wildlife, and Recreation Values. Season of use changes are proposed only on Improve category allotments under Alternative B, Planning Recommendation, and there would be no change of season under Alternative D, No Action.

The proposed seasons of use are designed to improve the condition of the available vegetation by providing rest from grazing during the critical growth period of key plant species. The proposed seasons are based on a 4-year (1978-1981) phenology study covering the EIS area.

The proposed season would remain in effect until a grazing system was implemented that would meet the physiological requirements of key plant species. Beginning and ending dates of each season of use are limits only; grazing use could be authorized for any period of time as long as the use falls between the beginning and ending dates. Allocation levels are based on the entire season; therefore, the allocation would change if beginning or ending dates were different from those proposed.

Implementation Schedule

Figure 3 diagrams the general implementation schedule. Changes in season of use would be implemented the first grazing year following the issuance of a decision. Changes in total AMs (increases or decreases) of



[a] If consultation results in substantial changes from actions outlined in the RPS, issuance of decisions will be deferred until after the RPS update.

[b] Decisions requiring more than 17 months to issue will be identified in the RPS update. The RPS update will give the reason for the extended time period and describe further actions needed to issue decisions by a specified date.

FIGURE 3

General Implementation Schedule

less than 10 percent would be implemented the first grazing year after the issuance of a decision. Changes greater than 10 percent would be phased in over a 5-year period with adjustments taking place in the first, third and fifth years. During this period, monitoring would be used to determine if the full measure of the proposed adjustment is warranted.

No schedule is proposed for implementation of AMPs or vegetation manipulations. These activities have historically been done on a "when-time-and-money-are-available" basis. Under the selective management policy, allotments in the Improve category would receive first priority; those in the Maintain category would have second priority, and Custodial category allotments would be last priority. Site-specific EAs will be done on all vegetation manipulations, range improvements and AMPs before they are implemented.

Monitoring

Allotments will be monitored to determine the response of vegetation to changes in livestock management. The monitoring data to be gathered include (1) actual use submitted by the livestock operator, (2) utilization of forage, and (3) vegetation characterization. Characterization is a description of the existing vegetation. It measures the density (number of plants per acre) of each species present and the age and form classes present. Characterization is used to measure trend. Since the Soil-Vegetation Inventory Method (SVIM) includes characterization data, the SVIM inventory done in 1978 and 1979 will be the base years for characterization-based trend data. Table 2 shows the frequency of monitoring proposed.

TABLE 2

Frequency of Monitoring by Allotment Category

Category	Actual Use	Utilization	Characterization
Maintain	Every 3 Years	Every 3 years	Every 5 years
Improve	Yearly	Yearly	Every 3 years or after each rest treatment
Custodial	To coincide with utilization study	Every 5 years	Every 5 to 10 years

In addition to individual allotment monitoring, the areawide phenology studies would be continued. An areawide bioclimatology study is also proposed. This would involve a minimum of four sites (Figure 4)

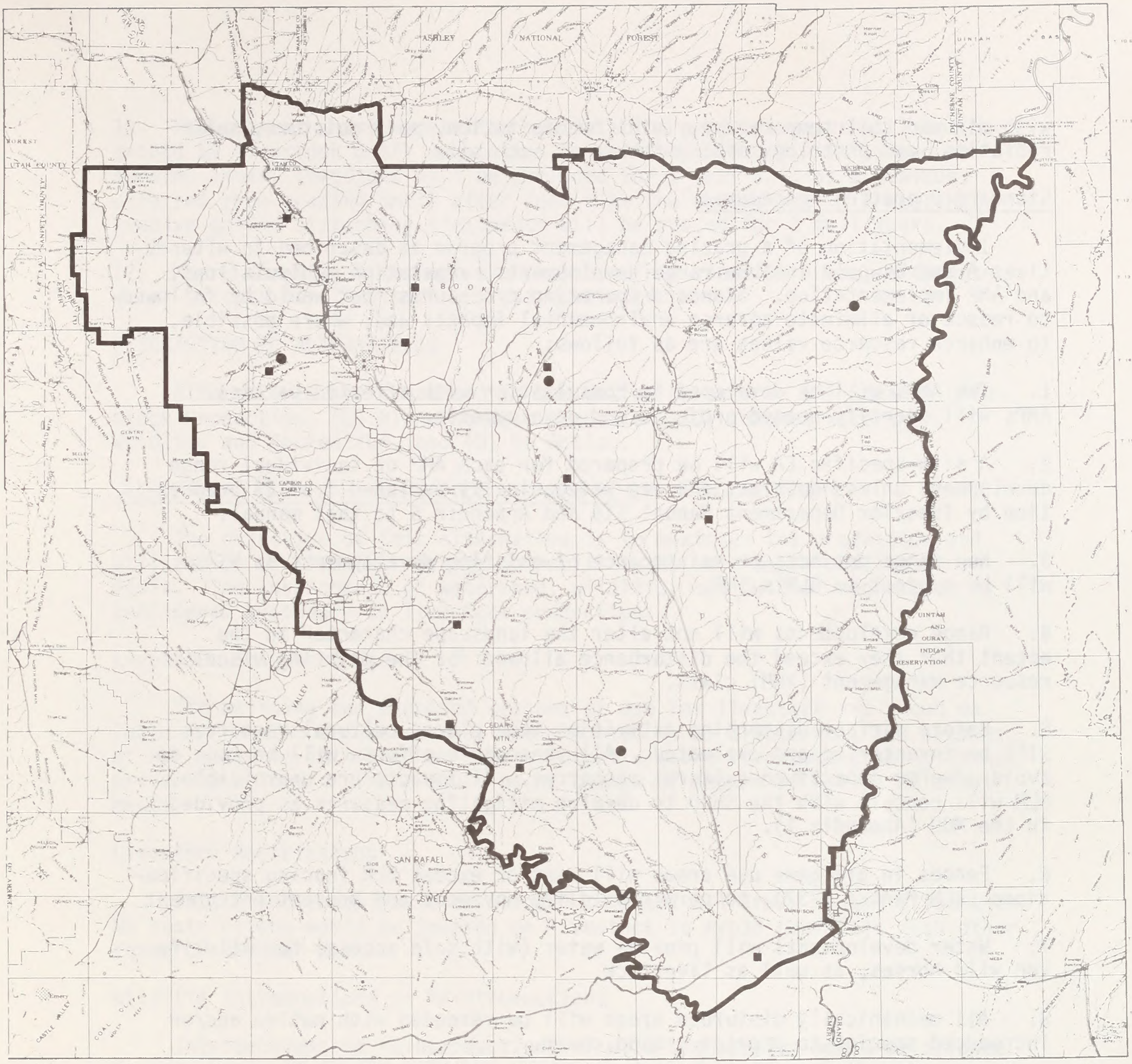
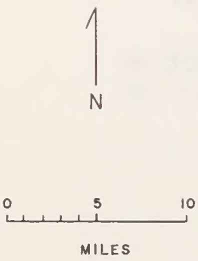


FIGURE 4

PHENOLOGY AND BIOCLIMATOLOGY STUDY SITES

■ PHENOLOGY STUDY PLOT LOCATIONS (EXISTING)

● BIOCLIMATOLOGY STUDY SITES (PLANNED)



with air and soil temperature, total precipitation, soil moisture, solar radiation, and phenology data gathered at each site.

Standard Operating Procedures

Implementation of a grazing management program as described in Alternatives A and B would include range developments, vegetation manipulations, and AMP implementation. Standard operating procedures that would be followed to reduce or eliminate adverse environmental impacts and, where possible, to enhance resource values are as follows:

1. The AMPs will be developed in consultation with affected parties. AMPs will identify needed projects and developments.

2. A site-specific EA will be prepared for each AMP or individual range development unless such actions are categorically excluded from EA preparation by Interior Department Manual 516 and Appendix 5 to that manual.

3. New range projects or maintenance of existing developments in WSAs will be subject to BLM's IMP.

4. Range developments will not alter the landscape character to the extent that they exceed the disturbance allowed for the existing visual resource management (VRM) class.

5. Before surface disturbing activities take place, cultural resources will be inventoried and evaluated. All reasonable efforts will be made to avoid adverse impacts on cultural resources. If impacts are unavoidable, BLM will consult with the SHPO to develop mitigating measures as provided in the MOU (Appendix 1).

6. Fences in big game use areas will meet or exceed BLM fencing specifications (BLM Manual 1737), to permit wildlife movement and prevent entrapment.

7. Water developments will provide water (with safe access) for wildlife and wild horses, as well as livestock.

8. All mechanically disturbed areas will be reseeded with native and/or introduced species to provide ground cover.

9. Application of herbicides will be in conformance with BLM Manual 9220 and State of Utah and Environmental Protection Agency (EPA) standards.

10. Site-specific inventories for threatened or endangered species will be completed before any project is implemented. If Federally listed plants or animals are found, and BLM determines they might be affected, BLM will consult with FWS in accordance with Section 7 of the Endangered Species Act of 1973 (as amended) before proceeding with the project.

11. Those areas where vegetation manipulation projects occur will not be grazed by livestock until vegetation is well established. On burned or sprayed areas, livestock will be excluded for 1 year and, as a minimum, deferred from grazing until after seed ripe the second year. Areas that receive ground disturbing treatments will be rested for 2 full years.

12. Where domestic livestock are excluded from riparian areas, alternate water sources for livestock will be developed.

DESCRIPTION OF ALTERNATIVES

Alternatives are presented in the following order: (A) Enhance Livestock Production, (B) Planning Recommendation, (C) Enhance Watershed, Wildlife and Recreation, and (D) No Action.

ALTERNATIVE A - ENHANCE LIVESTOCK PRODUCTION

The objective of this alternative is to maximize the production and utilization of livestock forage on public lands on a sustained yield basis. The enhancement of watershed, wildlife, and outdoor recreation is considered secondary to livestock production.

Livestock Season of Use

The existing and proposed seasons of use for livestock are shown on Table 3. Season of use changes are proposed on 85 allotments, and seasons of use would be initiated on five allotments where livestock grazing is not presently allowed. There would be no change of season of use on 28 allotments.

Livestock Restrictions

Cattle and sheep would be allowed to graze all areas on all allotments. No restrictions would be imposed on livestock to avoid conflicts with other resource uses or users.

Wildlife Introductions or Reintroductions

Introductions or reintroductions of wildlife species would be allowed to occur only if there would be no adverse impact on livestock such as forage or water competition, predation, disease or parasite transmission, or increased livestock disturbance caused by increased numbers of hunters.

Vegetation Manipulation

Vegetation manipulation is proposed on allotments in the Improve (I) and Maintain (M) categories. Projects on M category allotments would not be implemented until all projects on I category allotments were completed.

TABLE 3

Existing and Proposed Season of Use for Each
Allotment by Selective Management Category

Allotment Name	Category	Existing Season From	Existing Season To	Proposed Season From	Proposed Season To
Beaver Creek	Maintain	5-16	10-15	7-1	10-30
Canyon		5-1	6-10	6-1	10-30
Deadman		5-1 10-1	5-15 10-15	6-1	10-30
Huff Bench		5-26	10-15	6-20	10-30
Kyune I[1]		6-1	10-30	6-1	10-30
Lila Canyon[2]		N/A		7-1	10-30
Long Bench[1]		6-1 10-1	6-30 10-30	6-1 10-1	6-30 10-30
Lookoff		5-1	10-15	6-20	10-30
Lucky Lemon Flat		3-20	9-30	12-1	2-28
Mohrland[1]		4-1	6-15	4-1	6-15
Mudwater[1]		7-16	8-16	7-16	8-16
North Clarks Valley		3-20	6-5	6-1	3-15
North Hollow[1]		8-1	10-30	8-1	10-30
Price Canyon East[1]		5-16	11-15	5-16	11-15
Trail Spring		1-20 1-10	4-15 4-1	12-1	2-28
Wildcat[1]		7-1	7-30	7-1	7-30
Bear Canyon	Improve	5-16	10-15	6-10	10-30
Bench		4-1	5-31	11-1	3-15
Big Spring		11-1	4-30	11-1	3-15
Buckmaster		12-1	4-30	12-1	2-28
Cat Canyon		4-1	4-30	11-1	3-15
Chimney Rock Flat		5-1	11-30	11-1	3-15
Church Flat		3-5	6-5	11-1	3-15
Clarks Valley		4-16 10-16	5-31 12-31	11-1	3-15
Cleveland Summer[1]		5-1	9-30	5-1	9-30
Coal Creek		4-16 10-16	5-31 10-31	5-15	7-1
Columbia		1-1	1-31	6-1	10-30
Consumers Wash		5-5	6-4	6-1	3-15
Coon Springs		11-1	5-31	12-1	2-28
Corner		5-1	9-30	5-1 12-1	7-30 3-15
Cove	too early	3-1	5-31	12-1	2-28
Cow Canyon		6-1	10-15	7-1	10-30
Crandall Canyon		5-1 7-17	6-3 10-31	6-15	10-30

Allotment Name	Category	Existing Season		Proposed Season	
		From	To	From	To
Dripping Springs		3-1	5-31	12-1	2-28
Dry Canyon		5-1	6-30	6-1	10-30
Elliot Mountain		11-1	5-10	12-30	3-15
Fan Canyon[1]		11-1	2-28	11-1	2-28
Farnham		4-21	5-10	12-1	2-28
Gordon Creek[2]		N/A		4-15	6-15
Green River North		1-1	12-31	6-10	3-15
Haley Canyon		5-16	6-30	4-15	10-30
		9-16	10-15		
Hayes Wash[1]		4-15	6-15	4-15	6-15
Hiawatha		6-1	7-15	5-15	10-15
				12-1	3-15
Humbug		11-1	4-15	12-1	2-28
Icelander[1]		11-1	3-15	11-1	3-15
Iriart		5-1	10-30	6-1	10-30
Kimball Canyon		11-1	6-30	6-1	10-30
Kyune II[1]		6-1	10-30	6-1	10-30
Last Chance		11-1	4-30	6-10	2-28
Little Park[1]		5-26	10-10	5-26	10-10
Mounds		4-16	5-15	12-1	2-28
Mud Springs		10-20	6-10	4-15	3-15
North Spring		2-1	3-21	6-1	10-30
Oil Well Draw		2-1	12-30	12-1	2-28
Pine Canyon[1]		6-1	10-30	6-1	10-30
Pinnacle Bench		4-20	5-19	4-15	5-19
		12-2	1-2		
Poison Spring Bench[1]		4-20	6-15	4-20	6-15
		12-1	2-24	12-1	2-24
Pole Canyon		5-16	10-15	6-10	10-30
Porphyry Bench		6-10	6-30	5-15	10-30
		10-20	12-1		
Price Canyon West[1]		5-16	11-15	5-16	11-15
Price River North		5-15	9-15	12-1	2-28
Price River South		5-15	9-15	12-1	2-28
Range Creek[1]		6-1	6-15	6-1	6-15
		10-1	10-15	10-1	10-15
River		12-1	4-10	6-10	2-28
Rock Canyon[1]		6-1	10-15	6-1	10-15
Rock Creek		3-1	10-31	6-10	10-30
Sage Flat		4-16	5-25	11-1	2-28
		10-11	2-9		
Sheep Canyon		5-1	10-30	6-15	10-30
Soldier Canyon		11-16	6-15	6-1	2-28
South Olsen Lake		12-1	4-10	12-1	2-28

Allotment Name	Category	Existing Season		Proposed Season	
		From	To	From	To
Spring Canyon		5-15	10-31	6-20	10-30
Stone Cabin		5-1	9-30	6-10	10-30
Sulfur Canyon		5-1	10-15	6-1	3-15
Summerville		10-16	5-15	12-1	2-28
Trail Canyon[1]		5-16	10-15	5-16	10-15
Wattis		5-1	9-30	6-10	10-30
Willow Creek		5-1	10-15	6-1	10-30
Wood Hill		11-1	6-1	4-15	10-30
Woodside		11-1	9-15	6-10	10-30
				12-12	12-28
Airport	Custodial	4-16	5-31	11-1	3-15
Allred North		6-1	10-15	7-1	10-15
Allred South		3-1	3-31	12-1	2-28
Anderson[2]		N/A		12-1	2-28
Blind Canyon		4-16	10-15	6-1	10-30
Box Flat		3-1	5-15	12-1	2-28
Brown		5-1	5-31	11-15	2-28
Buckskin		6-16	9-30	7-15	10-30
Calf Canyon		1-1	5-15	12-1	2-28
Canal Cattle		5-1	5-15	12-1	2-28
Cleveland Winter[1]		11-1	2-28	11-1	2-28
Closed to Grazing[2]		N/A		12-1	2-28
Dugout[1]		6-16	11-15	6-16	11-15
Elmo		10-16	11-30	11-1	2-28
Erramouspe		10-15	5-20	11-1	3-15
Fausett		11-1	5-31	11-1	3-15
Fish Creek		5-16	10-15	6-10	10-30
Grassy Trail[1]		4-20	5-19	4-20	5-19
Green River South[1]		1-1	1-21	1-1	1-21
Jensen[1]		12-1	12-31	12-1	12-31
Johnson Huff Hollow[1]		6-1	10-15	6-1	10-15
Keel		5-1	6-30	6-1	10-30
		10-1	10-31		
Marakis		6-1	6-30	7-1	10-30
		10-16	11-15		
Marsing		12-1	4-15	11-15	2-28
Mathis Wash		12-1	3-31	11-15	2-28
Max Canyon		5-1	11-30	6-10	10-30
Miller Creek		12-1	6-10	11-15	2-28
North Olsen Lake		12-1	4-10	12-1	2-28
Oviatt[1]		12-1	2-28	12-1	2-28
Pace Canyon		5-16	10-15	6-10	10-30
Patmos[1]		6-1	10-25	6-1	10-25
Peterson[2]		N/A		12-1	2-28
Range Mountain		6-16	10-15	7-15	10-30

Allotment Name	Category	Existing Season From	Existing Season To	Proposed Season From	Proposed Season To
Rim Rock[1]		5-16	10-15	5-16	10-15
Smith		3-1	6-10	11-15	2-28
Staker		10-15	4-15	12-1	2-28
Victor		10-16	4-30	12-1	3-15
Washboard		4-16	5-31	11-15	3-15
Wellington		5-1	5-20	12-1	2-28

1/ No change proposed.
2/ No livestock grazing at present, but season of use proposed.

Figure 5 shows the locations and types of projects proposed. Table 4 shows acres that would be affected and net cattle AM gains anticipated. The primary use of AMs gained would be to increase livestock production.

TABLE 4

Vegetation Manipulation, Alternative A

Improve Category	Type	Acres	AMs Gained
	Chaining	46,284	4,016
	Chain and Seed	18,772	3,670
	Herbicide Spray	6,577	1,110
	Prescribed Burn	1,150	131
	Plow and Seed	2,961	505
	Subtotal	75,744	9,432
Maintain Category	**Type**	**Acres**	**AMs Gained**
	Chaining	874	74
	Chain and Seed	2,402	627
	Herbicide Spray	169	32
	Prescribed Burn	0	0
	Plow and Seed	137	27
	Subtotal	3,582	760
	Grand Total	79,326	10,192

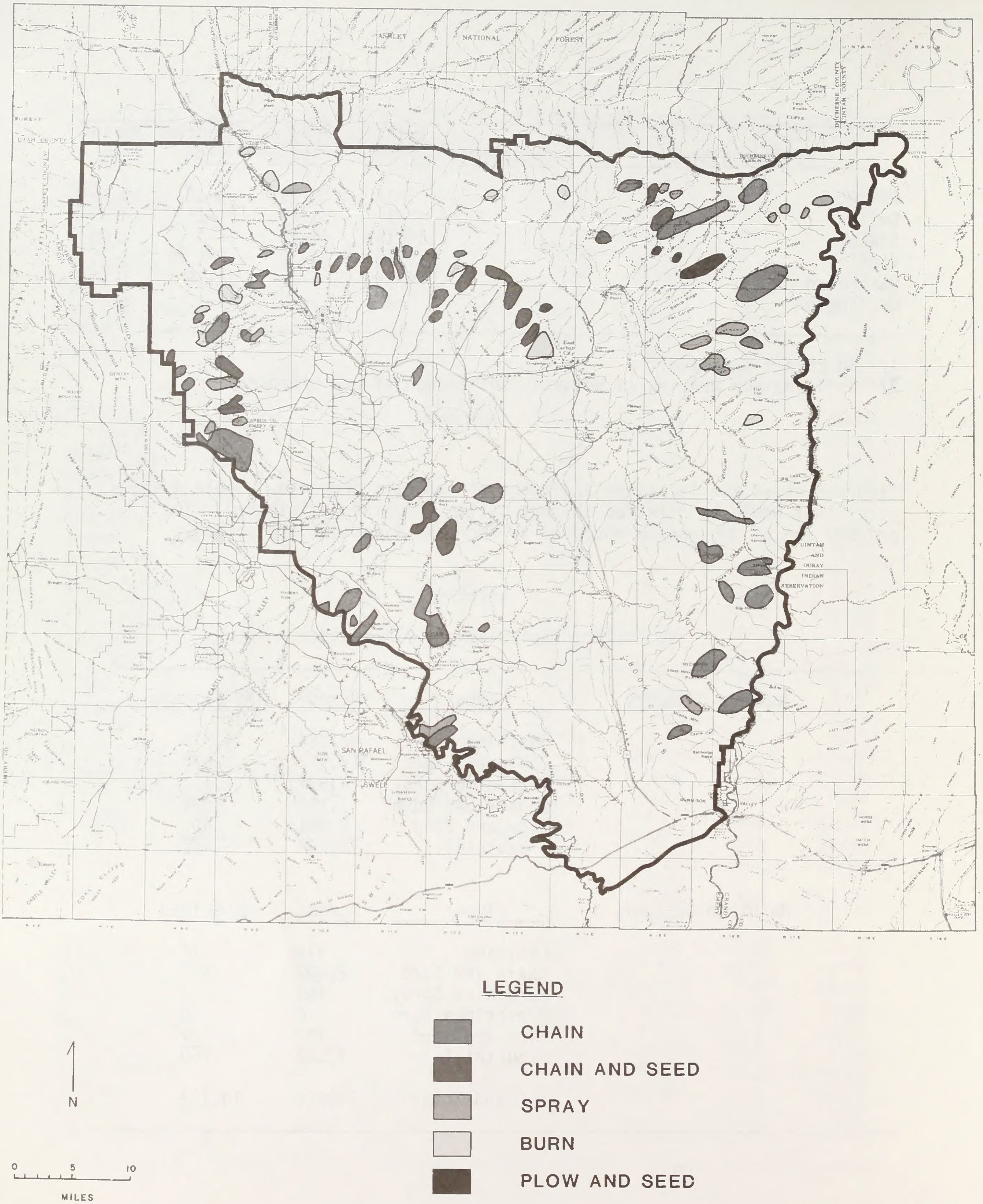


FIGURE 5
PROPOSED VEGETATION MANIPULATION PROJECTS
ALTERNATIVE A

Forage Allocation

The proposed allocation of AMs to domestic livestock by selective management category would be as follows:

Category	AMs Sheep	AMs Cattle
Maintain	15,568	3,129
Improve	128,011	30,545
Custodial	29,288	5,761
Total	172,867	39,435

Specific forage allocation figures by allotment are shown in Appendix 4.

ALTERNATIVE B - PLANNING RECOMMENDATION

This alternative is a livestock management program that incorporates multiple use recommendations from the MFP for the Resource Area. This is the BLM management preferred alternative. The objective is to provide livestock forage on a sustained yield basis without causing undue degradation of other resource values or uses.

Livestock Season of Use

The season of use would be changed on 51 allotments under this alternative. These changes are proposed on I category allotments only (Table 5). The season of use on 12 I category allotments and all M and Custodial (C) category allotments would not change, but would be as shown under existing season on Table 3.

Livestock Restrictions

Livestock use would be restricted in some I category allotments. These restrictions would be imposed to avoid conflicts with other resource uses and users. Table 6 shows the allotments that would be affected, the restrictions imposed and the conflict that would be avoided or mitigated.

Wildlife Introductions or Reintroductions

Wildlife reintroductions would be allowed where present cooperative agreements already exist (See Appendix 8 for list).

Vegetation Manipulation

Vegetation manipulation is proposed only on allotments in the I management category. Refer to Figure 6 for the locations and types of projects proposed. Table 7 shows acres affected and cattle AM gains anticipated.

TABLE 5

Proposed Season of Use Changes on Improve Category Allotments for Alternative B

Allotment Name	Existing Season		Proposed Season	
	From	To	From	To
Bear Canyon	5-16	10-15	6-10	10-30
Bench	4-1	5-31	11-1	3-15
Big Spring	11-1	4-30	11-1	3-15
Buckmaster	12-1	4-30	12-1	2-28
Cat Canyon	4-1	4-30	11-1	3-15
Chimney Rock Flat	5-1	11-30	11-1	3-15
Church Flat	3-5	6-5	11-1	3-15
Clarks Valley	4-16	5-31	11-1	3-15
	10-16	12-31		
Coal Creek	4-16	5-31	5-15	7-1
	10-16	10-31		
Columbia	1-1	1-31	6-1	10-30
Consumers Wash	5-5	6-4	6-1	3-15
Coon Springs	11-1	5-31	12-1	2-28
Corner	5-1	9-30	5-1	7-30
			12-1	3-15
Cove	3-1	5-31	12-1	2-28
Cow Canyon	6-1	10-15	7-1	10-30
Crandall Canyon	5-1	6-3	6-15	10-30
	7-17	10-31		
Dripping Springs	3-1	5-31	12-1	2-28
Dry Canyon	5-1	6-30	6-1	10-30
Elliot Mountain	11-1	5-10	12-30	3-15
Farnham	4-21	5-10	12-1	2-28
Gordon Creek	N/A		4-15	6-15
Green River North	1-1	12-31	6-10	3-15
Haley Canyon	5-16	6-30	4-15	10-30
	9-16	10-15		
Hiawatha	6-1	7-15	5-15	10-15
			12-1	3-15
Humbug	11-1	4-15	12-1	2-28
Iriart	5-1	10-30	6-1	10-30
Kimball Canyon	11-1	6-30	6-1	10-30
Last Chance	11-1	4-30	6-10	2-28
Mounds	4-16	5-15	12-1	2-28
Mud Springs	10-20	6-10	4-15	3-15
North Spring	2-1	3-21	6-1	10-30
Oil Well Draw	2-1	12-30	12-1	2-28
Pinnacle Bench	4-20	5-19	4-15	5-19
	12-2	1-2		
Pole Canyon	5-16	10-15	6-10	10-30

Allotment Name	Existing Season		Proposed Season	
	From	To	From	To
Porphyry Bench	6-10	6-30	5-15	10-30
	10-20	12-1		
Price River North	5-15	9-15	12-1	2-28
Price River South	5-15	9-15	12-1	2-28
River	12-1	4-10	6-10	2-28
Rock Creek	3-1	10-31	6-10	10-30
Sage Flat	4-16	5-25	11-1	2-28
	10-11	2-9		
Sheep Canyon	5-1	10-30	6-15	10-30
Soldier Canyon	11-16	6-15	6-1	2-28
South Olsen Lake	12-1	4-10	12-1	2-28
Spring Canyon	5-15	10-31	6-20	10-30
Stone Cabin	5-1	9-30	6-10	10-30
Sulfur Canyon	5-1	10-15	6-1	3-15
Summerville	10-16	5-15	12-1	2-28
Wattis	5-1	9-30	6-10	10-30
Willow Creek	5-1	10-15	6-1	10-30
Woodhill	11-1	6-1	4-15	10-30
Woodside	11-1	9-15	6-10	10-30
			12-12	12-28

TABLE 6

Livestock Restrictions, Alternative B

Restriction	Reason or Conflict	Allotment (Or Area)
No sheep grazing Cattle grazing late spring and summer only (May 1 to August 30)	Critical deer winter range and critical elk winter range if indicated by *	Coal Creek, Consumers Wash, Gordon Creek, Haley Canyon, Hiawatha*, Hayes Wash, Pinnacle Bench, Porphyry Bench, Wattis*, Little Park, Soldier Canyon, Price Canyon West, North Spring.
	Critical elk winter range	Crandall Canyon, Spring Canyon, Trail Canyon.
No sheep grazing. No cattle grazing March 15 to June 1	High priority antelope range	Cat Canyon, Church Flat, Clarks Valley, Columbia, Fan Canyon, Farnham, Icelander, Mounds, Mud Springs, Oil Well Draw
No sheep grazing	Bighorn sheep range	Price River South, River, Elliot Mountain (between cliffs and Green River)
Fall grazing only	Riparian habitat, erosion potential, and streambank instability	Green River North (Green River, Flat Canyon and tributaries, Nine Mile Creek, Cottonwood Creek and tributaries); Rock Creek (Green River, Flat Canyon and tributaries, Rock Creek and tributaries, Snap Canyon); Last Chance, Range Creek (Green River, Range Creek and tributaries); Price River North, Woodside, Sage Flat, Crandall Canyon, Farnham, Church Flat, Dripping Springs, Cat Canyon, Humbug, Summerville, Cove (Price River); Elliot Mountain, River, Price River South (Price River, Willow Creek); Price Canyon West (Price River, Fork Creek); Icelander (Price River, Grassy

Restriction	Reason or Conflict	Allotment (Or Area)
		Trail Creek); Buckmaster (San Rafael River); Mud Springs (Grassy Trail Creek); Stone Cabin, Pole Canyon, Sulfur Canyon, Iriart (Nine Mile Creek); Soldier Canyon (Soldier Creek); Coal Creek (Coal Creek, Soldier Creek); Corner (Coal Creek)
No livestock in Dinosaur Quarry or Price Canyon Recreation Area	Developed recreation sites	Cleveland Summer, Price Canyon West
Livestock grazing in Green River corridor only between September 15 and November 15	Floatboating and recreation use	Green River North, Rock Creek, Last Chance, River

TABLE 7

Vegetation Manipulation, Alternative B

Type	Acres	AMs Gained
Chain and Seed	30,774	6,016
Herbicide Spray	625	105
Prescribed Burn	6,036	687
Plow and Seed	1,316	224
Total	38,751	7,032

The priority use of AMs gained through vegetation manipulation would be to relieve grazing pressure on heavily impacted or poor condition native range.

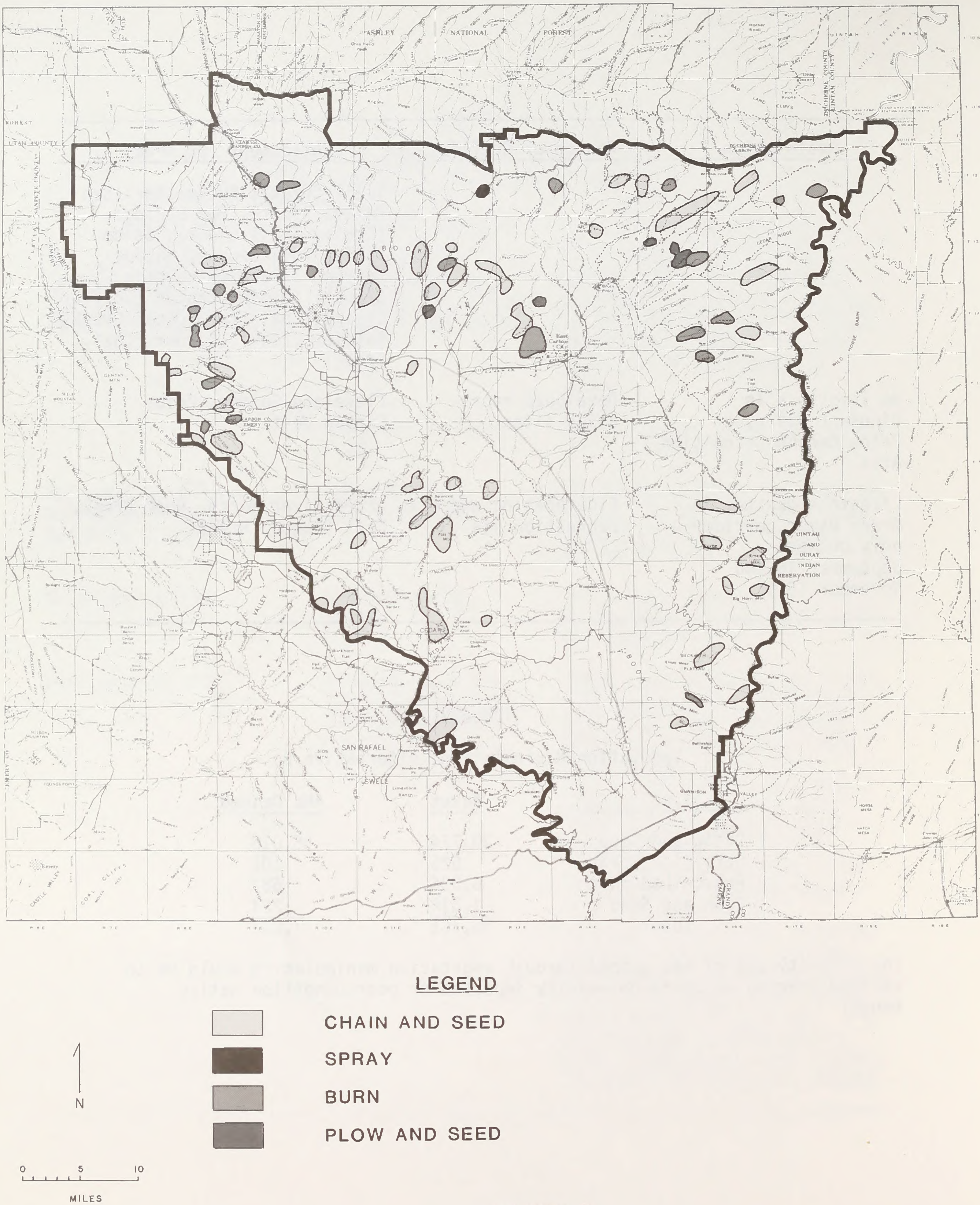


FIGURE 6
PROPOSED VEGETATION MANIPULATION PROJECTS
ALTERNATIVE B

Forage Allocation

The proposed allocation of AMs to domestic livestock by selective management category would be as follows:

Category	AMs Sheep	AMs Cattle
Maintain	1,121	1,987
Improve	6,138	31,107
Custodial	437	2,980
Total	7,696	36,074

The allocation for I category allotments is based on the SVIM inventory data. The allocation of forage for cattle on allotments in this category is larger (562 AMs) in this alternative than in Alternative A due to two factors. In areas where sheep use would be eliminated, the forage would be allocated to cattle, and the methodology used for allocation (Appendix 3) favors cattle in this alternative. Allocation for M and C category allotments is based on the average licensed use for the 5-year period 1976-1980. Specific forage allocation by allotment is shown in Appendix 4.

ALTERNATIVE C – ENHANCE WATERSHED, WILDLIFE, & RECREATION

This alternative is a multiple use recommendation favoring watershed, wildlife and recreation. Enhancement of livestock production would be secondary to consideration of these other uses. The livestock management actions proposed are those that would enhance or be neutral to watershed, wildlife, and recreation. The objective of the alternative is to use reduced or otherwise modified livestock grazing to enhance watershed values, wildlife productivity, and outdoor recreation users' experience. At the same time, it would provide for livestock grazing on a sustained yield basis at a level having the least possible impact to other resource uses and users.

Livestock Season of Use

The proposed season of use changes would be as described in Table 3 under Alternative A, Enhance Livestock Production.

Grazing Systems

Livestock use would be restricted or modified to avoid impacts. If livestock grazing is needed to meet a wildlife, watershed or recreation objective, it would be authorized on a prescription basis. This would be done through the issuance of a temporary nonrenewable grazing license.

Livestock Restrictions

Livestock grazing would be restricted as specified in Table 8.

TABLE 8

Livestock Restrictions, Alternative C

Restriction	Reason or Conflict	Allotment (Or Area)
No sheep grazing, cattle grazing in late spring and summer only (May 1 to August 30)	Critical deer winter range and critical elk range if indicated by *	Airport, Allred North, Bear Canyon, Blind Canyon, Canyon, Coal Creek, Columbia, Consumers Wash, Corner, Deadman, Dugout, Fausett, Fish Creek, Gordon Creek, Haley Canyon, Hiawatha*, Hayes Wash, Iriart, Kimball, Kyune II, Last Chance, Little Park, Long Bench, Max Canyon, Mud Springs, North Springs, Pace Canyon, Pine Canyon, Pinnacle Bench, North Clarks Valley, Porphyry Bench, Price Canyon East, Price Canyon West, Range Creek, Rock Creek, Sheep Canyon, Soldier Canyon, Willow Creek, Woodhill, Wattis*, Green River, Woodside.
	Critical elk winter range	Crandall Canyon, Trail Canyon
No sheep grazing and no livestock grazing March 15 to June 1	High priority antelope range	Bench, Big Spring, Cat Canyon, Chimney Rock Flat, Clarks Valley, Cleveland Summer, Cleveland Winter, Coon Spring, Cove, Dripping Spring, Elliot Mountain, Elmo, Farnham, Grassy Trail, Humbug, Icelander, Mathis Wash, Mounds, Mud Spring, North Olsen Lake, Oil Well Draw, South Olsen Lake, Summerville, Trail Spring, Victor, Woodside.
No livestock grazing	Bighorn sheep range	Box Flat, Calf Canyon, Elliot Mountain (between cliffs and Green River), Price River South, River, Woodside, Buckmaster (west of Tidwell Draw).

Restriction	Reason or Conflict	Allotment (Or Area)
	Riparian habitat, erosion potential, and streambank instability	Green River North (Green River, Flat Canyon and tributaries, Nine Mile Creek, Cottonwood Creek and tributaries); Rock Creek (Green River, Flat Canyon and tributaries, Rock Creek and tributaries, Snap Canyon); Last Chance, Range Creek (Green River, Range Creek and tributaries); Price River North, Fish Creek, Woodside, Beaver Creek, Price Canyon East, Sage Flat, Crandall Canyon, Farnham, Church Flat, Dripping Springs, Cat Canyon, Humbug, Summerville, Cove (Price River); Elliot Mountain, River, Price River South (Price River, Green River); Kyune II, Willow Creek (Price River, Willow Creek); Price Canyon West (Price River, Ford Creek); Icelander (Price River, Grassy Trail Creek); Buckmaster (San Rafael River); Mud Springs (Grassy Trail Creek); Stone Cabin, Blind Canyon, Keel, Rimrock, Pole Canyon, Sulfur Canyon, Iriart, Max Canyon (Nine Mile Creek); Soldier Canyon (Soldier Creek); Coal Creek (Coal Creek, Soldier Creek); Corner (Coal Creek); Kyune I (Kyune Creek, Price River); North Hollow (Minnie Maude Creek)
No livestock in Green River corridor	Riparian habitat, floatboating, and recreation	Green River North, Rock Creek, Last Chance, River

Restriction	Reason or Conflict	Allotment (Or Area)
No livestock in Dinosaur Quarry, Cedar Mountain Recreation Area, or Price Canyon Recreation Area	Developed recreation sites	Cleveland Summer, Lookoff, and Price Canyon West
No livestock grazing	Erosion potential, gully formation, and streambank instability	Trail Spring (Lost Spring Wash drainage)
No livestock grazing March 1 to June 30	High priority, Class 3 Cutthroat trout fishery	Trail Canyon, Spring Canyon
No livestock grazing in sage grouse nesting areas from April 1 to July 1	Sage grouse production, competition for forbs, and trampling of nests	Kyune I, Kyune II, and Green River

Wildlife Introductions or Reintroductions

Wildlife transplants would be allowed wherever feasible on existing native range. These transplants along with priorities and dates are shown in Appendix 8.

Vegetation Manipulation

No vegetation manipulation would be done for the benefit of livestock. If vegetation manipulation is done for wildlife, watershed, or forestry, no permanent increased allocation would be given to livestock based on AM gains. If surplus forage should become available, it could be grazed by livestock only on a temporary, nonrenewable basis.

Forage Allocation

The allocation of AMs to domestic livestock would be as follows:

Category	AMs Sheep	AMs Cattle
Maintain	1,865	1,841
Improve	1,117	15,213
Custodial	2,649	2,797
Total	5,631	19,851

Specific forage allocation by allotment is shown in Appendix 4.

ALTERNATIVE D - NO ACTION

This alternative assumes that management of livestock would continue at present levels. The objective of this alternative is to maintain the status quo. There would be no changes in season of use or kind of livestock. Season of use would be the existing season as shown on Table 3 under Alternative A, Enhance Livestock Production. Present livestock management is described in Chapter 2 under Livestock Grazing. No new studies, AMPs, livestock facilities, or vegetation manipulation for livestock forage enhancement would occur. Existing studies would be continued, and existing facilities maintained. This is the management preferred alternative for allotments in the M and C categories.

Two levels of use would be considered. The first level is the average licensed use during the 5-year period from 1976 to 1980. This is about 61 percent of the total active preference. The second level of use is active preference. This is the amount of AMs that could be activated and used on public lands in the EIS area. The active preference level will be used for a worst-case analysis of Alternative D. Table 9 shows both levels of use for the three allotment management categories. Active preference and average licensed use are shown by allotment in Appendix 4.

TABLE 9

Active Preference and Average Licensed Use

	Active Preference		Average Licensed Use (1976-1980)	
Allotment Category	Cattle	Sheep	Cattle	Sheep
Maintain	2,969	4,930	1,987	1,121
Improve	37,971	33,250	25,339	4,859
Custodial	4,136	2,775	2,980	437
Total	45,076	40,955	30,306	6,417

ALTERNATIVES CONSIDERED BUT NOT ANALYZED

See Chapter 4, Consultation and Coordination for a discussion of alternatives that were considered during scoping, but were not analyzed in this document.

SUMMARY OF IMPACTS

Analysis of environmental consequences of the alternatives reveals that none would measurably impact climate, air quality, topography, geology, minerals, paleontology, threatened or endangered species, visual resources, wilderness, cultural resources, or urban land use. Measurable impacts, both beneficial and adverse, would occur to vegetation, livestock grazing, wildlife, watershed, forestry products, recreation, and economics.

Table 10 summarizes significant impacts by alternative. The figures and information presented in this table represent the overall cumulative impacts by resource for each alternative. For more detailed analysis, and adverse or beneficial impacts by allotment, area, herd unit, and type and size of livestock operation see Chapter 3.

Table 10
Comparison of Environmental Consequences

Resource	Current Situation		Alternative A		Alternative B		Alternative C		Alternative D	
Vegetation	Ecological Condition:		Ecological condition improve except on some high-use areas. Increased herbaceous production on treated P-J and sage areas (10,192 AMs).		Ecological condition improve. Some continued deterioration of riparian and wet meadow areas. Increased production on P-J and sage areas (7,032 AMs).		Ecological condition improve except on some high-use areas of riparian and wet meadow types.		Ecological condition decline, reduced productivity, and loss of riparian, wet meadow, and aspen areas.	
	Acres	Percent								
	Excellent - 54,879	5								
	Good - 268,196	25								
	Fair - 462,896	42								
	Poor - 301,705	28								
Livestock Grazing	Average licensed use:		AMs Allocated	AMs Change	AMs Allocated	AMs Change	AMs Allocated	AMs Change	AMs Allocated	AMs Change
	Cattle AMs -	30,306	39,435	+ 9,129	36,074	+ 5,768	19,851	- 10,455	45,076	+ 14,770
	Sheep AMs -	6,417	172,867	+ 166,450	7,696	+ 1,279	5,631	- 786	40,955	+ 34,538
Wildlife	Present AM demand:		AMs Available	AMs Change	AMs Available	AMs Change	AMs Available	AMs Change	AMs Available	AMs Change
Deer		128,136	65,765	- 62,371	208,127	+ 79,991	215,035	+ 86,899	161,487	+ 35,351
Antelope		5,196	3,412	- 1,784	78,830	+ 73,634	77,679	+ 72,483	59,511	+ 54,315
Elk		5,323	2,661	- 2,662	27,658	+ 22,335	27,715	+ 22,392	21,079	+ 15,756
Moose		96	181	+ 85	1,396	+ 1,300	1,471	+ 1,375	1,353	+ 1,257
Desert Bighorn		180	173	- 7	13,179	+ 12,999	17,428	+ 17,248	16,983	+ 16,803
Rocky Mtn. Bighorn		636	673	+ 37	13,478	+ 12,842	14,234	+ 13,598	8,490	+ 7,854
Wild Horses		300	300	0	489	+ 189	839	+ 539	347	+ 47
Watershed										
Condition Trend	Fair, declining		Decline		Static		Improve		Decline	
Annual livestock water demand	75 acre-feet		175 acre-feet		90 acre-feet		50 acre-feet		125 acre-feet	
Forest Products	400,000 acres P-J. Annual fuelwood sales 7,460 cords.		68,332 acres P-J chained. Fuelwood available 10,250 cords.		30,774 acres P-J chained. Fuelwood available 4,616 cords.		Invasion of P-J on 32,100 acres of previously chained areas.		Invasion of P-J on 32,100 acres of previously chained areas.	
Recreation	Annual visitor days (5-year average)		Visitor Days	Visitor Days Change	Visitor Days	Visitor Days Change	Visitor Days	Visitor Days Change	Visitor Days	Visitor Days Change
Hunting:										
Big Game		67,613	27,475	- 40,138	71,683	+ 4,070	77,015	+ 9,402	71,479	+ 3,866
Small Game		10,322	10,322	0	10,322	0	10,322	0	10,322	0
Boating		32,300	35,000	+ 2,700	35,000	+ 2,700	35,000	+ 2,700	35,000	+ 2,700
Economics										
Operator Income and Wealth:		Amount	Amount	Change	Amount	Change	Amount	Change	Amount	Change
Operator income		$ 1,065,050	$ 2,232,064	+1,167,014	$ 985,935	- 79,115	$ 540,215	- 524,835	$ 1,065,050	decline (long-term)
Ranch value		42,000,000	41,879,760	- 120,240	41,060,772	- 939,228	40,062,600	-1,937,400	42,000,000	0
Regional Income and Employment:										
Income from Livestock		2,008,000	2,112,000[a]	+ 104,000	2,061,000	+ 53,000	1,357,265	- 650,735	2,008,000	0
Income from Hunting		1,634,000	710,000	- 924,000	1,727,000	+ 93,000	1,849,000	+ 215,000	1,723,000	+ 89,000
Income from Boating		376,000	376,000	0	376,000	0	376,000	0	376,000	0
Jobs (livestock, hunting, and boating)		304	255	- 49	313	+ 9	294	- 10	310	+ 6

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[a] For regional income analysis it was assumed that not all of the allocated sheep forage would be used. Therefore, this figure is smaller than the figure above for operator income.

CHAPTER 2

AFFECTED ENVIRONMENT

INTRODUCTION

This chapter describes the existing environment of the PRRA. Climate, air quality, geology, minerals, paleontology, topography, visual resources, and lands would not be affected by the proposed action or alternatives; therefore, these resources will not be discussed in any detail. A brief discussion of climate, air quality, and topography is included to describe the setting of the area. This is followed by a description of vegetation, livestock grazing, wildlife, watershed, forest products, recreation, wilderness, cultural resources, and socioeconomics. Data presented are commensurate with the significance of the anticipated impacts. Less important material is summarized or simply referenced.

SETTING

The PRRA is generally a semiarid environment of mancos lowlands and open country with low-lying, flat-topped to conical rolling shale hills dominating in some areas. There are also some fairly extensive pediment remnants rising 100 to 400 feet above stream levels. Elevation ranges from 4,080 feet at Green River to 10,285 feet at Bruin Point. The area is bounded by the Wasatch Plateau escarpment on the west and includes the Book Cliffs and Roan Cliffs on the north and east (Figure 7). Most of the area behind these escarpments ranges from 5,000 to 9,000 feet in elevation. Lowland floor elevations range from 5,000 to 6,000 feet. The area is drained by the Green River (the eastern boundary of the area) and its tributaries, the Price and San Rafael rivers.

The general climate is semiarid with annual precipitation ranging from 6 to 25 inches. Mean annual precipitation on the Book Cliffs and Roan Cliffs is 16 inches. The long-term precipitation average on the lowlands ranges from 6.06 inches at Green River to 11.23 inches at Sunnyside (Price is 9.88 inches). On the Wasatch Plateau average precipitation is 25 inches, mostly during the winter. Droughts occur about 1 out of every 5 years and may last for 1 to 2 years. The potential evapotranspiration rate is high (up to 33 inches in desert areas) and generally exceeds precipitation in the area. Most summer moisture comes in the form of thunderstorms of high intensity and short duration. In the lowlands the majority of precipitation occurs from May to August. Temperatures in the area range from 10 degrees F to more than 100 degrees F. The average annual temperature at Green River is 52 degrees F, while at Sunnyside it is 46 degrees F. The average frost free days range from 20 to 160 (Green River 160 days, Sunnyside 130).

Air quality in the area is generally good with occasional occurrences of blowing dust which exceed particulate levels established by National

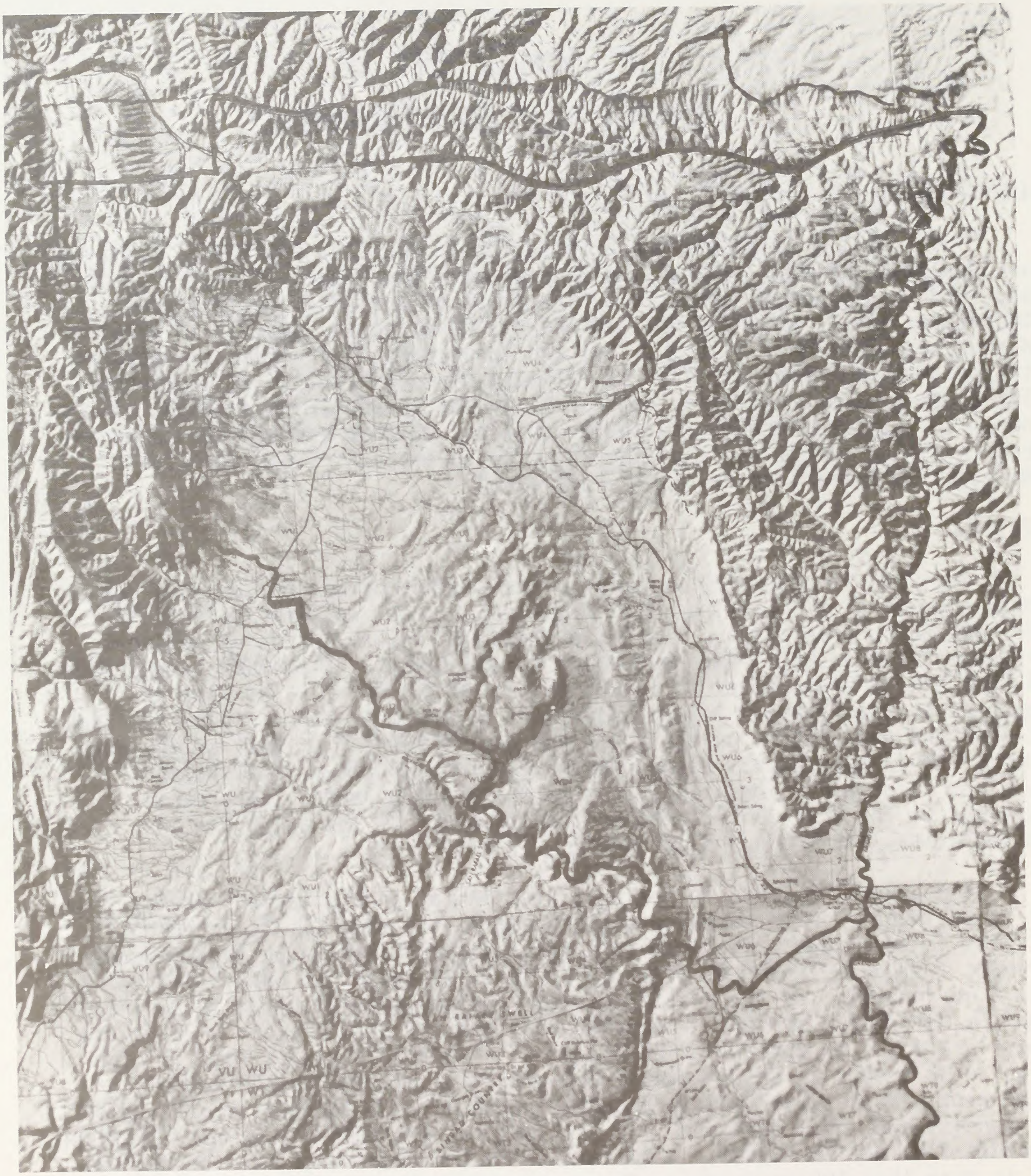


FIGURE 7
TOPOGRAPHY OF AREA

Ambient Air Quality Standards. The area is currently classified as Class II under Prevention of Significant Deterioration (PSD) standards. This classification allows some deterioration normally accompanying well controlled growth.

RESOURCES

Vegetation

The vegetation of the EIS area is complex and varied. Over 100 range sites and over 2,000 strata have been identified. Vegetation varies from salt and drought tolerant shrubs in the desert lowlands to white fir and Douglas fir on the higher mountains. This variety is caused by the great range in elevation and precipitation zones. Plate 2 inserted at the back of the text shows a very general mapping of vegetation zones.

Vegetation Data Base

The vegetation and forage availability information presented in this document was gathered using the SVIM (See BLM Manual 4412 for a description of inventory procedures). All of the public land in the EIS area is covered by the SVIM inventory. Vegetation surveys and a third order soil survey were done during the 1978 and 1979 field seasons. Mapping was done at a scale of 1:24,000, and these maps are on file at the Price Area Office. The soil survey was done under contract by the Soil Conservation Service (SCS). Vegetation was mapped and described by BLM range personnel.

The SVIM data is the best vegetation and soils information available for the EIS area. Vegetation production from SVIM data was the basis for proposed livestock forage allocations; ecological condition and the baseline for trend monitoring were also derived from the SVIM data.

Range Condition

As used in this document, range condition refers to ecological condition, rather than to forage or habitat condition for any species of animal.

More specifically, range condition is defined as the relationship of the present vegetation to the potential for the range site. If the present vegetation composition is greater than 75 percent of the potential range site composition, the condition rating is excellent (climax or near climax). From 51 to 75 percent is good (late seral); 25 to 50 percent is fair (mid seral), and less than 25 percent is poor (early seral). The acreages of the four condition classes on public lands in the EIS area are as follows:

Class	Acres	Percent
Excellent	54,879	5
Good	268,196	25
Fair	462,896	42
Poor	301,705	28

A map is not provided due to constraints imposed by scale. Overlays of condition classes at a scale of 1:24,000 are on file in the Price Area Office.

Vegetation Types

Riparian Vegetation: Riparian vegetation is the characteristic succulent and woody vegetation found along stream courses. In terms of acreage, these areas make up slightly less than 1 percent of the EIS area; however, the riparian zone is more important than its small size would indicate. It is one of the highest producers of forage per acre; it is important wildlife habitat for numerous game and nongame species; it stabilizes streambanks; and it affects quantity and quality of water in the stream. Additionally, it adds to the diversity of the area and is highly valued by recreationists. Approximately 475 miles of stream bottom in the EIS area support or should support riparian vegetation.

Most of the riparian areas are in poor condition. Some perennial streams have little associated riparian vegetation; the zone has been completely invaded by sagebrush, rabbitbrush and cheatgrass. On Cottonwood Creek near its confluence with Nine Mile Creek, ecological condition is poor for approximately 85 percent of its length. In other areas, riparian vegetation seems to be retreating upstream. On Deadman and Dugout creeks, and on others along both sides of the Book Cliffs, remnants of a riparian zone can be seen a mile or more downstream from the present riparian zone. These remnants include riparian grasses barely surviving underneath sagebrush and dead specimens of the woody riparian species. Parts of the Price River and Green River riparian zones are dominated by tamarisk and cheatgrass.

There are several causes of the present degradation of the riparian habitat. Abuse by livestock is certainly the most significant. The effects of improper grazing on riparian habitats are well documented in the literature. Wildfire followed by unmanaged grazing has contributed to the problem of cheatgrass and tamarisk along the Green River. Another factor impacting riparian vegetation is the construction of roads and other transportation corridors within the zone.

Aspen: Aspen occurs in three range sites in the EIS area. It forms a seral community in Douglas fir sites after a fire. It is found in riparian areas, and it is a climax community in the High Mountain Loam (Aspen) range site. The key species in climax aspen types are young aspen, mountain brome and pea vine. Approximately 3,200 acres of climax aspen occur in the area. This total may be low, since some stands were too small to map during the inventory. Aspen sites, like riparian sites, have a much greater importance than their small size would indicate. They are very productive in terms of forage. They hold snow on watersheds and provide a unique microclimate for characteristic understory. Aspen is highly valued as wildlife habitat and by recreationists.

Many climax aspen areas are in degraded condition. Poor condition aspen stands are characterized by fully mature or overmature aspen and either a lack of understory or an understory being invaded by sagebrush. Some of the stands in the upper reaches of Gordon Creek consist of just a few old trees and a dense sagebrush understory. Healthy stands are mixed-age stands that have a very dense understory with young aspen sprouts present. Healthy stands occur in areas that are ungrazed or only lightly grazed due to inaccessibility.

Livestock grazing has been one of the major contributing factors to the loss of climax aspen in the EIS area. Aspen generally reproduce from root sprouts, and grazing of these sprouts before they reach a height of 4.5 feet results in the sprout becoming club-shaped and eventually being killed. As a result of continual use, some stands have not produced new trees in 60 years.

Wet Meadows: Wet meadows produce more vegetation per unit area than do any other vegetation types. The SVIM inventory mapped approximately 200 acres of wet meadow. The actual acreage is considerably higher, since many meadows were too small to map. Many are 1 acre or less in size.

There are two types of meadows in the EIS area. Mountain meadows are found above 7,000 feet; alkali meadows are found in very low desert areas in association with alkali seeps and springs. Key species of the mountain meadows are Kentucky bluegrass, rye, yarrow and cinquefoil. The alkali meadow's key species are alkali bluegrass, alkali sacaton and saltgrass.

Most meadows are in poor condition, and the acreage occupied by this type has decreased in recent times. Mountain meadows in poor condition are being invaded by sagebrush and iris. Trampling of these sites causes increased erosion. When gullies form, the water table is lowered, and plants that require less moisture can invade.

Mountain Browse: Eight range sites are mountain browse type. These areas provide forage for domestic stock and are critical to wildlife. Mountain browse types are characterized by the following species: serviceberry, gambel oak, curlleaf or mountain mahogany, cliff rose, snowberry, and ceanothus. Key species are the above woody species and letterman needlegrass, bluegrass, Indian ricegrass, western wheatgrass and slender wheatgrass.

The mountain browse types generally show a downward trend. This is evidenced by the age and form classes of key browse species. Generally they are mature or overmature and in a poor form class. Reproduction of key browse plants is virtually nonexistent over a large part of their range within the EIS area. Pinnacle Bench is a good example. On this bench, all the mahogany is over 40 years old, indicating that no reproduction has occurred in that time.

Probable causes of the downward trend are fall use by domestic livestock (especially sheep) and excessive utilization by deer. On Pinnacle Bench, utilization of available palatable browse in many cases is 100 percent of the current year's growth.

Pinyon-Juniper Woodland: The pinyon-juniper woodland inhabits semi-desert and upland zones throughout the EIS area. Several researchers believe the woodland has expanded its range since the arrival of white pioneers (West, 1981). Livestock grazing and fire suppression are considered to be the change agents favoring the growth of pinyon and juniper. The density of trees can vary from a few to over 3,000 stems per acre. When density exceeds around 700 trees per acre, most of the understory is lost. This is due to the highly competitive nature of these trees for space and water. Chemical compounds in the litter of these species also reduce herbaceous vegetation and slow nutrient cycling in the soil (Jameson, 1966, 1970; Peterson and Buss, 1974; Charley and West, 1977).

On favorable sites with deep soils and annual precipitation in excess of 12 inches, pinyon and juniper can greatly reduce the productivity of forage species. Removal of trees and subsequent release of herbaceous growth can greatly increase herbaceous forage production. Key species of the woodland may include Indian ricegrass, needle and thread grass, slender wheatgrass, western wheatgrass, and various bluegrasses.

Salt Desert Shrub: The salt desert shrub type occupies the largest vegetation zone in the area. It encompasses several range sites and is the predominant vegetation type found in areas below 5,700 feet. This zone is characterized by the dominance of some species of the genus Atriplex. In general, the key species for the zone are Indian ricegrass, galleta, winterfat and fourwing saltbush. These species are vulnerable to damage if grazed every year in the spring, and this vegetation type is generally in poor condition where spring grazing has been the usual practice.

Sagebrush-Grass: The sagebrush-grass type is commonly found on bench and park-like areas above 5,700 feet. The type is characterized by an overstory of sagebrush. The dominant sage may be big sage (Artemesia tridendata), low sage (A. arbuscula), or black sage (A. nova) depending on the range site. Key understory plants are Letterman needlegrass, Thurber needlegrass, bluegrass, native wheatgrasses, and rye grasses.

Like pinyon-juniper, sagebrush has been favored by past grazing and fire suppression practices. Production of herbaceous vegetation in this type can be increased by removing the competition of the woody sagebrush overstory.

Vegetation Manipulation Areas

During the 1960s, vegetation manipulation projects were conducted on 32,100 acres. Most of this work consisted of chaining and seeding pinyon and juniper woodlands. Plate 2 shows the locations of these projects.

All the areas were reseeded to crested wheatgrass, an exotic perennial grass. In some of the seedings, fourwing saltbush *(Atriplex canescens)*, yellow sweet clover, and alfalfa were included in the seed mixtures. The application of browse and forbs was generally less than 5 percent of the seed mixture. Light application or no application of other species resulted in nearly pure stands of crested wheatgrass.

The useful life of these types of developments is generally 20 to 30 years (Tausch and Tueller, 1977). The SVIM data confirms reinvasion of woody species in many of the seedings. The Poison Springs chaining, for example, has over 3,000 young juniper trees per acre.

Threatened, Endangered, and Sensitive Plants

Figure 8 shows the location and identity of endangered and sensitive plants. There are no officially listed threatened plants in the area. Sensitive plants are those under review for listing as threatened or endangered *(Federal Register*, 1980).

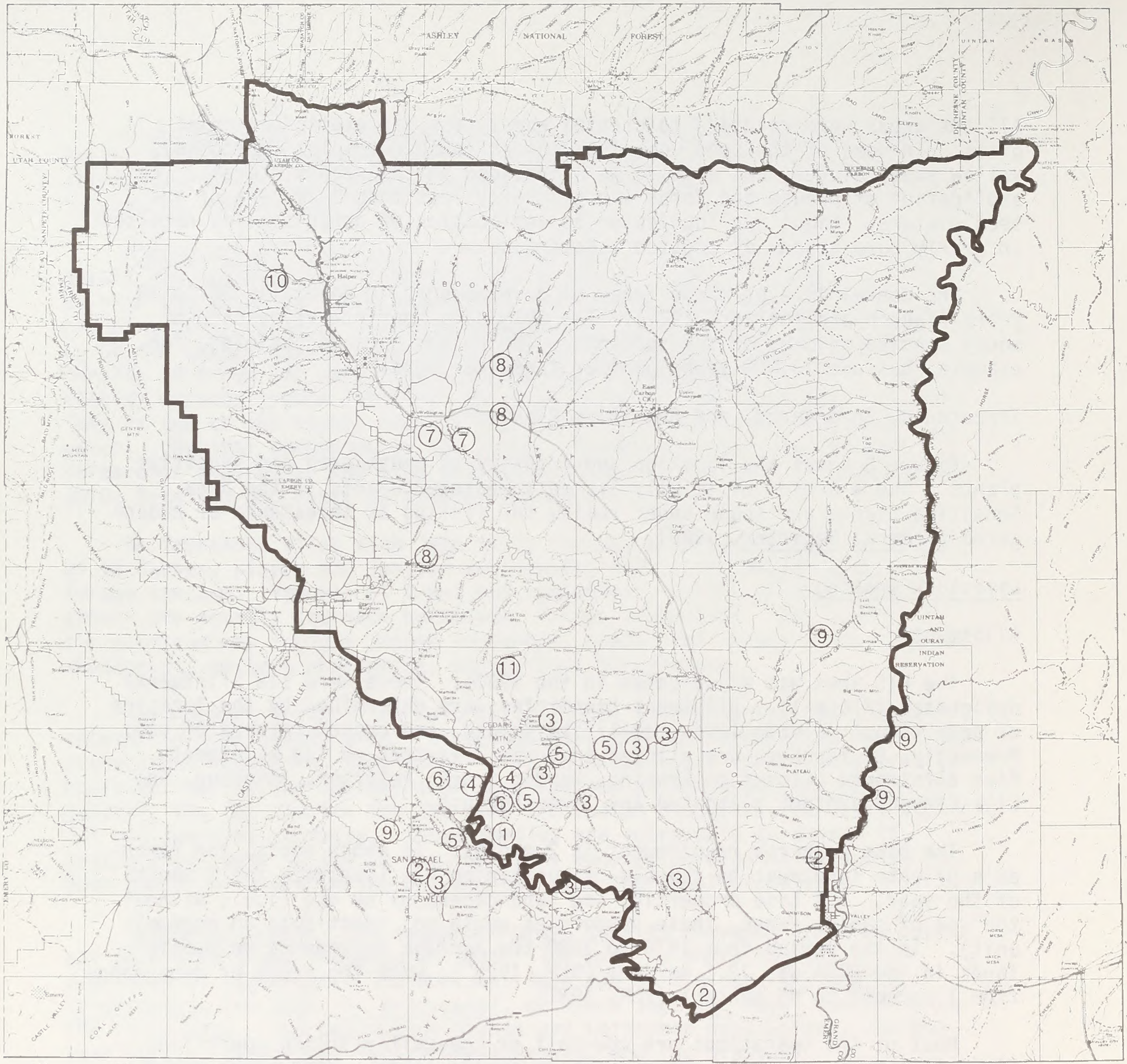
Livestock Grazing

Allotments

The EIS area was adjudicated in the 1960s. There were 118 allotments designated (Plate 1). Allotment boundaries were determined by the location of permittees' private lands, qualified demand, and customary area of use. Presently, 87 ranchers are allowed to graze livestock on 113 allotments. Five allotments (Closed to Grazing, Gordon Creek, Peterson, Anderson, and Lila Canyon) are not allocated any livestock use.

The base property requirement is 2 months. In other words, the rancher's private land must be capable of sustaining his livestock for 2 months of the year. All base properties are land-dependent by use (i.e., without the use of public range, these properties would not constitute an economic unit). In the period from 1976 to 1980 the average dependency on public lands in the PRRA was 22.1 percent (BLM, 1979[a]), with the range of dependency from 1 percent to 65 percent (BLM, 1982).

Most of the operations are cow-calf or cow-calf-yearling operations. Five permittees currently graze sheep on public lands. Herd sizes range from 8 to 1,600 cows and 21 to 1,800 sheep (BLM, 1982). Five additional permittees have run sheep in the last 5 years. The 1974 Census of Agriculture showed 21,870 cows and calves and 18,800 sheep in the area. Historically, the area was grazed more by sheep than by cattle. Today most operations have switched to cattle because an open range sheep operation is more labor-intensive. Declining wool markets and operators taking jobs in industry have also contributed to the decline in sheep operations. Most operators are part-time ranchers, and livestock contributes less than half of their income. Less than half of the operators have herds considered to be of economic size, more than 100 cows or 500 sheep (BLM, 1979a).



ENDANGERED AND SENSITIVE PLANT SPECIES

STATUS ENDANGERED

1 Sclerocactus wrightiae

STATUS UNDER REVIEW (SENSITIVE)

2 Asclepias ruthiae
3 Astragalus rafaelensis
4 Cryptantha johnstonii
5 Cryptantha jonesiana
6 Erigeron maguirei
7 Eriogonum corymbosum var. davidsei
8 Eriogonum lancifolium
9 Gaillardia flava
10 Hedysarum occidentale var. canone
11 Hymenoxys depressa

FIGURE 8

Season of Use and Forage Allocation

Season of use is shown by allotment on Table 3 in Chapter 1. Active grazing preference, last 5 years' average licensed use, and current forage production are as follows:

Animal	Active Preference	Average Licensed Use	Current Forage Production*
Cattle	45,076	30,306	23,663
Sheep	40,955	6,417	55,429

* Assumes current season of use and kind of livestock.

Active preference, average licensed use, and grazing capacity by allotment are shown in Appendix 4.

Allotment Management Plans

Nine allotments are covered by AMPs. These are Coal Creek, Elliot Mountain, Mud Springs, Stone Cabin, Poison Springs, Washboard, Cleveland Summer, Clarks Valley, and Soldier Canyon. Most of the AMPs have not been fully implemented because needed projects have not been constructed. Also, grazing rotation sequences have frequently been broken due to weather, forage conditions, and rancher desires.

Suitability

Not all lands in the area are suitable for livestock grazing. The term "suitable" is often confused with the word "usable." Many areas are grazed by livestock and therefore are usable, but they cannot be grazed without damage to soil and vegetation resources. Ranges are suitable only if they can be grazed on a sustained yield basis without damage to the soils or vegetation. Damage may occur on areas designated as unsuitable, but more commonly damage occurs on suitable range adjacent to unsuitable areas. In the range adjudication, suitability standards were not applied; consequently, forage on excessively steep slopes and outside the service area of water was allocated to livestock. As a result, more accessible bottom lands and areas close to water were overgrazed. Suitable, not usable, range should be the basis for forage allocation (Stoddart, Smith, and Box, 1975). The BLM recognizes four suitability criteria:

1. Slopes in excess of 50 percent are unsuitable.

2. Areas farther than 4 miles from water are potentially suitable.

3. Areas in the severe erosion class (Soil Surface Factor greater than 60) are potentially suitable.

4. Areas producing less than 25 pounds of forage per acre are potentially suitable.

Potentially suitable ranges are those that are not suitable at the present time but may become suitable through management or development activities. Management and developments on potentially suitable range will be considered during AMP development. In this EIS the term "unsuitable" refers to areas with slopes in excess of 50 percent. This classification would not change as a result of management or development activities.

Range Developments

Existing range developments would not be significantly impacted by any of the proposed or alternative grazing management plans; therefore, they are not described here. The existing chained and seeded areas are described in the vegetation section and their locations shown on Plate 2. A complete list of all existing projects, their location, condition, and responsibility for maintenance is in the URA Step III for the PRRA (BLM, 1982).

Wildlife

Introduction

The PRRA is inhabited by 368 terrestrial and 25 aquatic (fish) wildlife species. Of the 368 terrestrial species, there are 249 birds, 91 mammals, and 28 reptiles and amphibians. A complete list of these species and their status is presented in the URA Step 2, Wildlife Section (BLM, 1982). High interest wildlife species (big game animals, upland game) and Federally listed threatened or endangered species are discussed below.

Major Grazing Wildlife Species

Major grazing wildlife species occurring in the Resource Area include (in order of abundance) mule deer, pronghorn antelope, elk, desert and Rocky Mountain bighorn sheep, and wild horses. Figures 9 through 11 show distribution of these species.

Moose?

Two population estimates (prior stable and current) were developed for all big game animals. Methods used in determining these numbers are presented in Appendix 5. Prior stable estimates (provided by UDWR) represent a long-term stable population level, which in the case of mule deer has been demonstrated in past years. These estimates do not represent potential or maximum obtainable population levels. Current population estimates (provided by BLM) represent an average taken from the past 5 years. Prior stable and current population estimates are presented by species, herd unit, allotment, and season of use in Appendix 6.

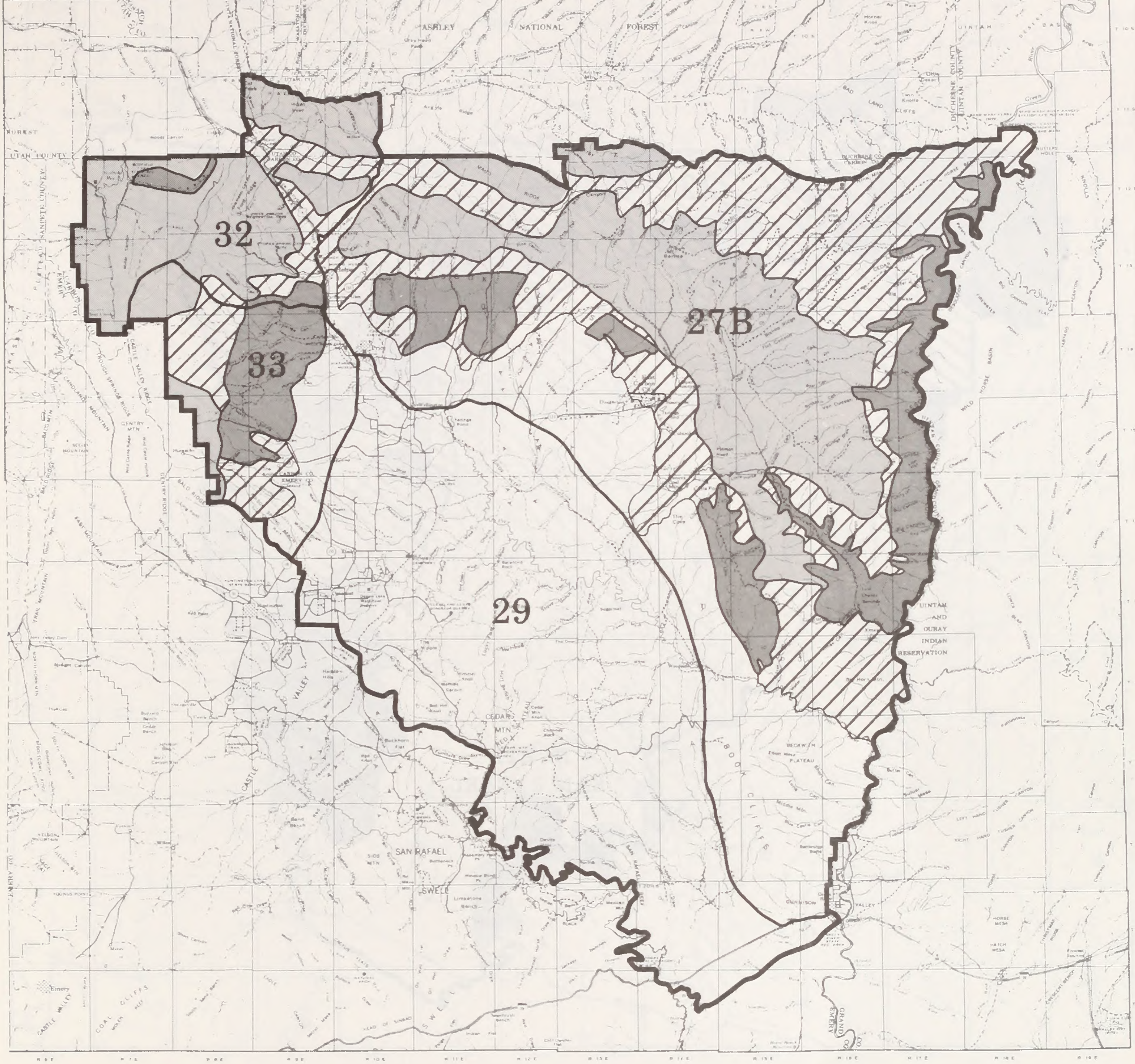


FIGURE 9

MULE DEER SEASONAL HABITAT DISTRIBUTION

▩ MULE DEER CRITICAL WINTER HABITAT

▨ MULE DEER WINTER HABITAT

▒ MULE DEER SUMMER HABITAT

☐ MULE DEER YEARLONG HABITAT

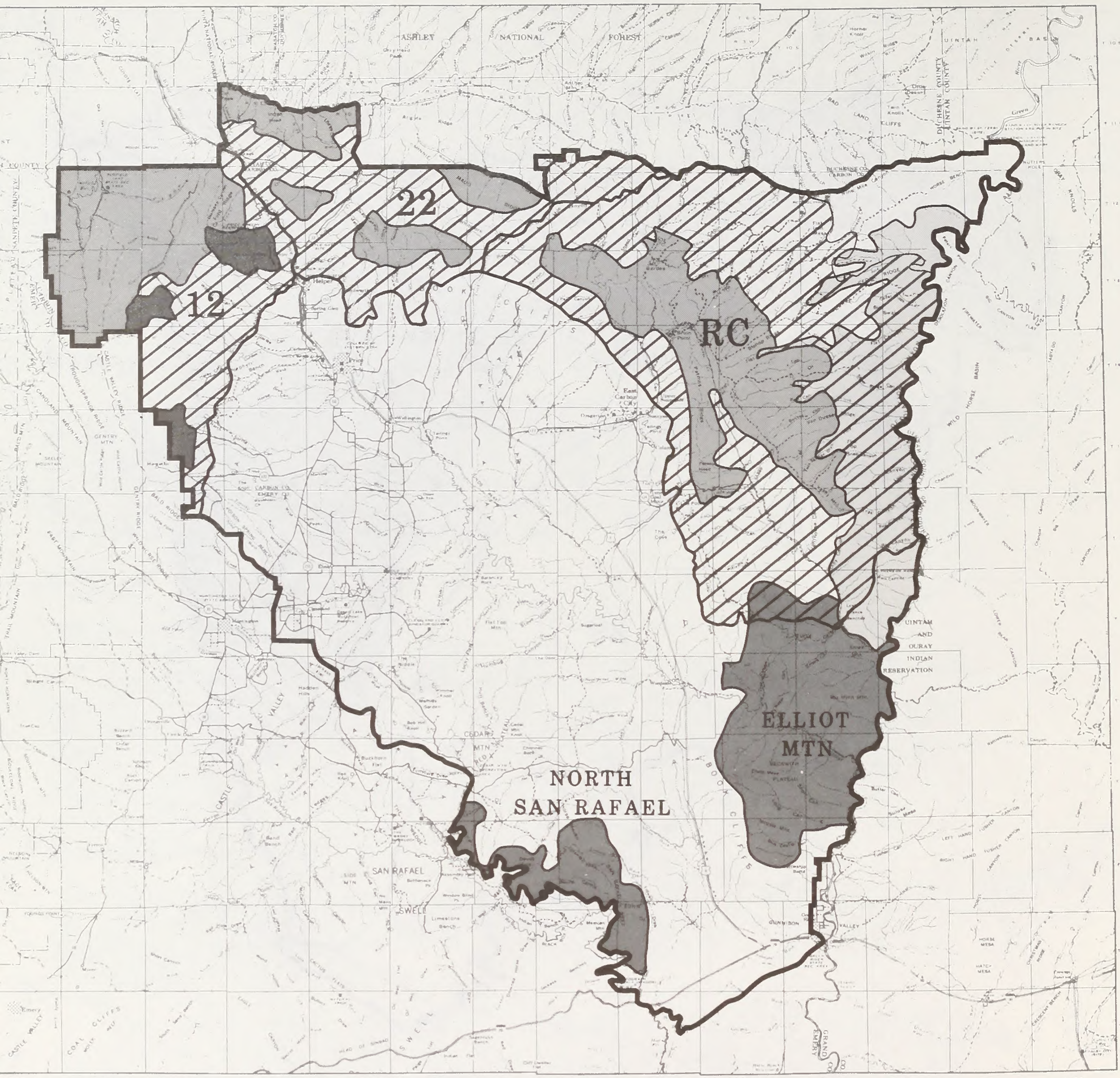


FIGURE 10

ELK AND BIGHORN SHEEP SEASONAL HABITAT DISTRIBUTION

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MILES

- ■ ELK CRITICAL HABITAT
- ▨ ELK WINTER HABITAT
- ▩ ELK SUMMER HABITAT
- □ ROCKY MOUNTAIN BIGHORN SHEEP YEARLONG HABITAT
- ■ DESERT BIGHORN SHEEP YEARLONG HABITAT

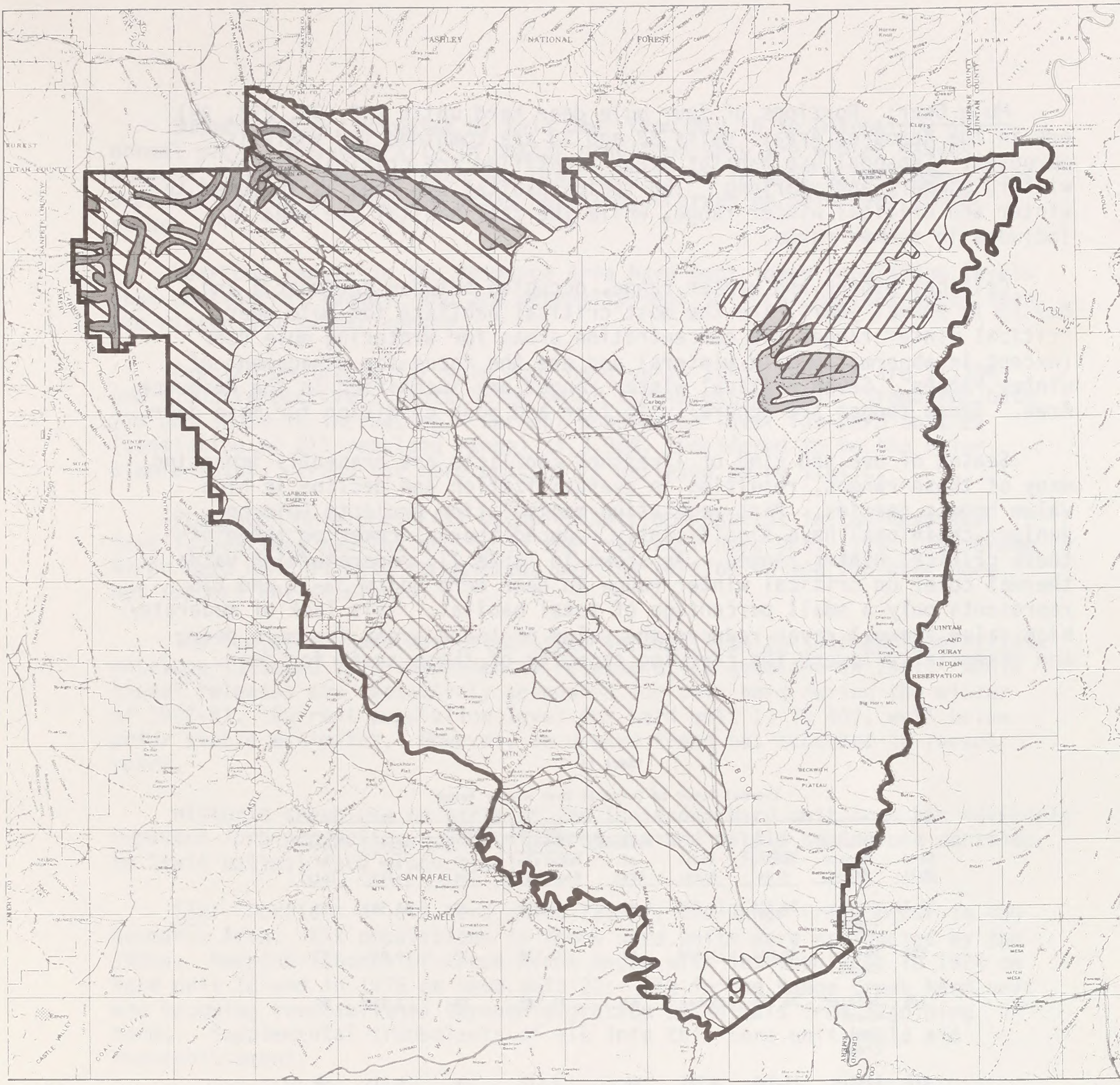
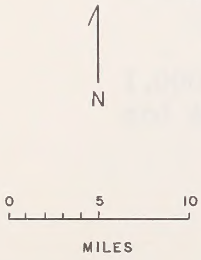


FIGURE 11
PRONGHORN ANTELOPE
MOOSE, WILD HORSE, AND SAGE GROUSE HABITAT DISTRIBUTION



■ MOOSE CRITICAL YEARLONG HABITAT
▧ MOOSE YEARLONG HABITAT
▨ WILD HORSE YEARLONG HABITAT
▩ SAGE GROUSE STRUTTING-NESTING HABITAT
▧ PRONGHORN ANTELOPE YEARLONG HABITAT

Mule Deer: Portions of four mule deer herd units (32, 33, 27B, 29) are in the Resource Area. Units 32 and 33 are combined for analysis purposes. Seasonal use habitat areas identified are critical winter, winter, summer, and yearlong. The spring habitat use area is included in winter and critical winter range, while the fall habitat use area is included in summer range.

Critical winter and winter range, occupied between November 1 and May 15 in normal years, are the most critical habitats for mule deer. Critical winter ranges are concentration areas for wintering mule deer (except in abnormally mild winters) and are the focus for management of winter ranges. Seven critical winter ranges are identified in the Resource Area. These ranges are generally in fair and poor condition for mule deer.

Season of use and kind of livestock conflicts are presently impacting many of these ranges, resulting in overutilization and decline in high value browse species. Past vegetation manipulation projects (pinyon-juniper chainings) have significantly reduced thermal cover on three of these critical winter ranges. As shown in Table 11, moderate/high value thermal cover on critical winter range in deer herd units 32-33 and 27B represents only a small percentage of total habitat. this lack of moderate/high value thermal cover reduces the value of these areas for mule deer, and essentially lowers the carrying capacity of these areas for deer.

TABLE 11

Thermal Cover on Critical Deer Winter Range

			Thermal Cover					
Herd Unit	Critical Winter Range	Acres Habitat Area[1]	Total Acres	Percent of Area	Acres Moderate/ High Value[2]	Percent of Total	Acres Low Value[3]	Percent of Total
32-33	Gordon Creek	36,619	14,898	41	3,335	22	11,563	78
27B	Range Creek	28,011	11,833	42	1,568	13	10,265	87
27B	Soldier Creek, Coal Creek	36,350	15,563	43	11,585	74	3,978	26
27B	Little Park	14,898	8,287	56	3,672	44	4,615	56
27B	Green River	Not Calculated						

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[1] Represents acres surveyed in SVIM intentory

[2] Moderate/High Value thermal cover is pinyon-juniper stands with tree density of 200 trees or more, 6 feet or taller, per acre.

[3] Low Value thermal cover is pinyon-juniper stands with less than 200 trees, 6 feet or taller, per acre.

Summer ranges, occupied by mule deer from May 16 to October 31 in normal years, are generally in better condition than are winter ranges. However, lack of reproduction has been identified in some aspen communities. Overutilization of riparian areas has also occurred on mule deer summer range.

Yearlong ranges in the Resource Area have much lower population levels than do seasonal ranges, and are generally less critical habitat areas than are winter and summer ranges.

Population levels for mule deer herd units 32-33 and 27B are 11,354 and 4,902 respectively (both below prior stable estimates). Trend for both 27B and 32-33 is increasing. Current population level for herd unit 29 (consisting of all yearlong range) is 3,068, considered to be the prior stable level. Trend for herd unit 29 is believed to be static.

Pronghorn Antelope: All occupied antelope habitat in the Resource Area is yearlong habitat and is in the Icelander Herd Unit (11). The Green River Herd Unit is also recognized, but the portion in the EIS area does not support any antelope.

The Icelander Herd was established in 1972 with an introduction of 149 antelope followed by a supplemental release of 40 antelope in 1981. Additional releases are tentatively scheduled for this herd during the winter of 1982-83. Current population level for herd unit 11 is 407, well below prior stable estimates. However, an upward trend has occurred in recent years.

Historic sheep use on parts of the Icelander herd unit area has adversely impacted forb production. Current sheep use and cattle spring use continue to limit optimal forb production.

Elk: Portions of elk herd units 12, 22, and Range Creek occur in the Resource Area. Elk populations in these herd units were extirpated by the 1900s. Reestablishment of these herds began with introductions in 1924 on herd unit 12 and in 1976 on herd unit 22. Elk in the Range Creek herd unit are becoming reestablished through migration of animals from adjoining herds. Supplemental transplants of elk into this herd unit would aid reestablishment.

Three seasonal use habitat areas (critical winter, winter, and summer) are identified in the Resource Area. Critical winter and winter are the most crucial habitats. Critical winter ranges in the Resource Area are generally in good ecological condition. Summer ranges are generally in good or fair ecological condition.

Current population levels for herd units 12, 22, and RC are 3,680, 1,000, and 48 respectively. All populations are below prior stable estimates and are in an upward trend.

Rocky Mountain and Desert Bighorn Sheep: Rocky Mountain bighorn sheep are present in the Resource Area in the Range Creek herd unit. Current population is estimated at 63. Desert bighorn sheep population in the Elliot Mountain herd is 15 and there are no sheep in the North San Rafael herd unit. Historic bighorn sheep populations in the Resource Area were extirpated (or nearly extirpated) in the mid 1900s.

Two reintroductions of Rocky Mountain bighorn sheep were made on the Uintah and Ouray Indian Reservation, adjacent to the Range Creek Herd Unit, in 1970 and 1973. Additional releases are planned in the near future.

The UDWR, in cooperation with the BLM Moab District, is reintroducing desert bighorn sheep in historic ranges. Two releases totaling 24 animals were made in 1978 and 1982 on the North San Rafael herd area just south of the Resource Area. A recent sighting of bighorn sheep on Elliot Mountain indicates that a small remnant herd of sheep still exists in that area. Additional reintroductions of sheep into the San Rafael herd and the Elliot Mountain Herd are scheduled to begin in the winter of 1982-83. Introduction of desert bighorn sheep into the Nine Mile drainage adjacent to the EIS area boundary has been proposed by the BLM Vernal District.

Rocky Mountain and desert bighorn sheep habitat is mostly steep terrain with poor accessibility for livestock. Much of the area is in good and excellent ecological condition. However, where livestock grazing occurs on bighorn sheep range, the bighorn sheep are adversely impacted by forage competition and disease transmission.

Moose: Historically, moose did not inhabit the Resource Area. However, based on habitat suitability studies conducted by UDWR, a total of 39 animals were introduced into the Scofield Reservoir area.

Moose habitat in the Resource Area is represented by yearlong and critical yearlong habitat. Yearlong habitat is largely marginal, but it represents the potential distribution of moose. Critical yearlong habitat is habitat used by moose for winter concentration areas, for spring calving areas, and for occasional use throughout the year. Critical yearlong habitats (riparian and associated conifer and aspen communities) are often overutilized by livestock.

The current moose population is 97, well below prior stable estimates. The current static trend is largely attributed to illegal harvest.

Sage Grouse and Other Upland Game

Sage grouse yearlong habitat and nesting, strutting, and brood rearing habitat are present in the Resource Area (Figure 11). Yearlong habitat is considered the general distribution of sage grouse in the Resource Area. Nesting and brood rearing habitat and strutting grounds are closely associated and are considered the most critical habitats for sage grouse. These habitat areas are characterized by dense stands of big sagebrush, many lacking understory species and interspersed with wet meadows. Prescribed burns have been conducted in some areas in attempts to open sagebrush stands and improve livestock forage. These projects have generally improved sage grouse nesting habitat by providing a mixed sagebrush community rather than a monotypic stand.

Sagebrush stands with 20 to 40 percent canopy cover are most valuable for nesting. Areas with sagebrush plants between 10 and 20 inches tall are most often selected for nesting.

Other upland game species found in the Resource Area include ruffed grouse, blue grouse, chukar partridge, mourning dove, cottontail rabbit, ring-necked pheasant, and California quail.

Aquatic Species

A total of 23 perennial tributary streams and rivers totaling 193 stream miles cross public lands in the Resource Area. Eight of these streams and rivers (listed below) support cold or warm water fish species. An asterisk (*) identifies those that support fisheries.

Water	Miles	Water	Miles
Green River*	77.5	Range Creek*	13.1
Nine Mile Creek	13.3	Price River*	46.5
Rock Creek*	11.6	San Rafael River	10.7
Grassy Trail Creek	12.3	Flat Canyon	8.0

Rock Creek and the upper reaches of the Price River and Range Creek support highly valued rainbow trout-brown trout fisheries. Rock Creek and Flat Canyon are potential reintroduction sites for the sensitive (State designation) Colorado cutthroat trout. Rainbow trout specimens taken from Rock Creek show up to 25 percent Colorado cutthroat trout characteristics. Upper reaches of these streams are generally in fair to excellent condition with little livestock damage to streambanks and vegetation reported. This is attributed to limited access for livestock. Lower reaches of these same streams are generally in poor to fair condition with heavy (up to 70 percent) livestock damage reported.

The Green River and lower Price River support a warm water sport fishery of primarily channel catfish. Also occurring in the Green River are the Federally listed endangered Colorado squawfish, bonytail chub, humpback chub and sensitive (BLM designation) humpback sucker. These rivers are generally in fair to poor condition with light to heavy (10 to 80 percent) livestock damage to riverbanks and vegetation recorded (BLM, 1982).

Threatened or Endangered Species

Six Federally listed endangered species occur in the Resource Area. They are the peregrine falcon, bald eagle, black-footed ferret, Colorado squawfish, humpback chub, and bonytail chub.

The peregrine falcon and bald eagle winter in the area. Winter concentration areas for the bald eagle have been identified in the Resource Area (BLM, 1982). Bald eagles may have nested along the Green River historically, but are not known or suspected to be nesting there presently. One historic peregrine falcon nest site is known just outside the Resource Area; however, proposed critical and essential habitat for this site is within the Resource Area. Based on recent sightings, continued nesting is suspected.

Unconfirmed sightings of the black-footed ferret in and around the Resource Area have been reported (BLM, 1982). Black-footed ferret distributions are traditionally associated with prairie dog towns. These towns have been identified (BLM, 1982); however, the white-tailed prairie dog is not exclusively colonial and is widespread throughout desert and semidesert habitats; consequently, distribution of possible ferret habitat may also be more widespread.

The Colorado squawfish, bonytail chub, and humpback chub occur in the Green River. Population decline leading to their endangered status is believed to be, in part, a result of changes (dams, reservoirs, etc.) in the Green River system. The section of the Green River in Desolation and Gray Canyons represents a significant portion of unaltered habitat for these species.

Wild Horses

A small wild horse herd exists in the Green River Allotment (4049). Current population estimate for this herd, determined by annual aerial census, is approximately 25 animals. Although the herd is believed to have existed for a long time, a 1973 inventory count of 150 animals is the earliest estimate. A field inventory conducted in 1979 revealed a preponderance of mature males and a lack of females and young. The study also indicated that the decline in the horse population may be caused by activities such as illegal capture or shooting.

Watershed

The SCS completed a soil survey of the EIS area in 1980 (SCS 1979 and 1980). The soils in the area are derived from sedimentary rocks of marine, freshwater, and continental origin (Stokes and Cohenour, 1956). The majority of soils are in climatic groups including desert, semidesert, upland, mountain, and high mountain. Other riparian or wetland groups include wet meadow, wet stream bottom, semiwet stream bottom, semiwet river bottom. Miscellaneous areas include badland, rockoutcrop, and irrigated.

Several soils are identified in the survey as saline. These include the Avalon, Badland, Bributte, Chipeta, Gypsum land, Persayo, Ravola, Toddler, and WL series (SCS, 1979 and 1980; and Wayne Svejnoha, BLM Grand Resource Area Soil Scientist, personal communication, May 1982). These soils are usually associated with Cretaceous marine sediments of the Mancos Formation, and some older marine sediments exposed in and around the San Rafael Swell.

Except for about 18,000 acres of highly saline soils associated with irrigated agriculture near Cleveland and Huntington, these soils are considered slightly to moderately saline (BOR, 1975). Nonsaline soils in the EIS area are found at higher elevations in the mountains, on some lowland benches, and associated with certain strata of the San Rafael Swell and Desert.

In addition to their salinity, most of these soils are rated from slight to critical by their Erosion Condition Class. Beebe, Bluewing, and JA are also rated critical (SCS, 1979 and 1980).

These saline, erosive soils have a great effect on local and regional water quality. When wetted, the deposited salts are brought into solution. If the water does not percolate into the soil or evaporate, it travels to a water course, carrying the dissolved salts with it. Salinity, measured as the concentration in milligrams per litre (mg/l) of dissolved solids in the Colorado River system, is a major regional and international issue (BOR, 1975. Salinity affects the use of this water for agricultural, domestic, industrial, and municipal purposes.

The major components of saline water originating in the EIS area are calcium, magnesium, potassium, sodium, bicarbonate, chloride, and sulfate ions. The divalent cations of calcium and magnesium also contribute to the hardness of water (Sawyer and McCarty, 1967).

Water supply in the EIS area is adequate for present needs. Shortages, rationing, and ranking by importance of beneficial uses may occur in the future as increased population and industrial demand require more water. Agriculture is the biggest consumer of water, but agricultural land is often converted to other uses in growth areas. The result is a decrease in consumed water per surface acre. Livestock are minimal consumers of water. Allowing for evaporation, a liberal figure for daily consumptive use is 25 gallons for a cow or horse and 5 gallons for a sheep. The annual water demand to meet active preference levels is about 125 acre-feet. At present there is an adequate water supply for livestock grazed on public lands; however, the distribution of water is not equitable with the distribution of livestock forage. In addition, some water facilities (such as stock ponds) will not hold water because of broken dams or seepage through the basin or dam. Some diverting works are inefficient, and leakage occurs from pipelines and troughs.

Forest Products

The only significant use of forest products from the Resource Area is from the extensive pinyon-juniper pygmy forest. The pinyon-juniper type is dominant on approximately 400,000 acres. This type generally occurs at elevations ranging from 4,500 to 7,500 feet. See Plate 2 for distribution of this vegetation type.

In the 1960s and early 1970s nine areas of pinyon-juniper, totaling 32,100 acres, were chained and seeded to other plant species. These chained areas are now being reinvaded by pinyon and juniper trees. In one chained area on Poison Springs Bench, a survey made in 1979 indicated 3,000 new trees per acre, mostly in the seedling and young age classes.

The demand for fuelwood has risen dramatically in recent years with increasing populations and energy demands. The development of more efficient woodburning stoves and the high cost of other energy sources have caused many families to rely on wood for at least part of their heat source. In the PRRA permits for fuelwood from public lands were issued as follows:

	Cords		
Permit Type	1979	1980	1981
Free Use	4,898	9,186	6,716
Commercial Sale	456	791	332

Source: BLM, 1982

Most of this wood came from the chainings mentioned earlier, where downed trees are now becoming scarce.

There is also some demand for Christmas trees from the area. After several years of not issuing any tree permits, the BLM authorized 487 permits in 1981 on a chained area north of East Carbon City.

Recreation

Public lands in the Resource Area provide recreational opportunities for local residents and also for nonresidents. An estimated 98,132 visits per year occur on public lands in the area, and 46 percent of all recreational use in the area occurs on public lands. The total income from recreation on public lands in the area is $973,590 per year. This represents 6 percent of the income to the trade and services sectors in Carbon County, but only 1.2 percent of total income (BLM, 1979a). The following sites or activities would be affected by proposed grazing management programs.

1. Green River Corridor (Desolation and Gray Canyons). This area is an 84-mile segment of the river which attracts about 6,000 floatboaters using about 58,330 visitor days (1981 season) per year. Almost 66 percent

of the visitors are nonresidents, and this activity generates a total annual income of $414,090 in the area (BLM, 1979a). There are about 150 undeveloped campsites along this section of the river. The most heavily used areas include locations where side canyons enter the river. Because of heavy recreation and livestock use where Rock Creek enters the Green River, an exclosure was built in 1981 to exclude livestock and reroute hikers. This area is also closed to overnight camping.

A 45-mile segment of the corridor from Nine Mile Creek to Florence Creek was designated a National Historic Landmark in 1969. The Green River through these canyons is also a candidate for study under the Wild and Scenic Rivers Act, and is included in the Desolation Canyon WSA.

The use season is from March to October, with highest use occurring during May, June, and July. Average trip length is 5.5 days. The carrying capacity has been established by BLM as 35,000 user days per year. User days are as follows:

	Year					
	1976	1977	1978	1979	1980	1981
User Days	29,225	29,900	30,049	34,504	35,400	31,815

Source: BLM, 1982

NOTE: 1 user day equals 1.83 visitor days based on average trip length.

2. Price Canyon Recreation Area. This is a BLM developed recreation area encompassing 160 acres. The area is located 15 miles northwest of Price (Figure 12). It includes one scenic overlook, 2 miles of trails, 19 single camp units, 10 single picnic units, and three group picnic areas. The use season is from June to late October. In 1981 the estimated use was 14,600 visitor days (BLM, 1982).

3. Cedar Mountain Recreation Area. This area is located approximately 31 miles south of Price or 21 miles east of Castle Dale (Figure 12). It includes 265 acres and has two scenic overlooks and 10 single picnic units. The use season is from mid April to October. Estimated annual use is 2,500 visitor days (BLM, 1982).

4. Hunting. Hunting for big game animals is an important recreational pursuit in the area. The PRRA includes parts of four deer herd units, three elk herd units and two antelope herd units. Currently hunting is not

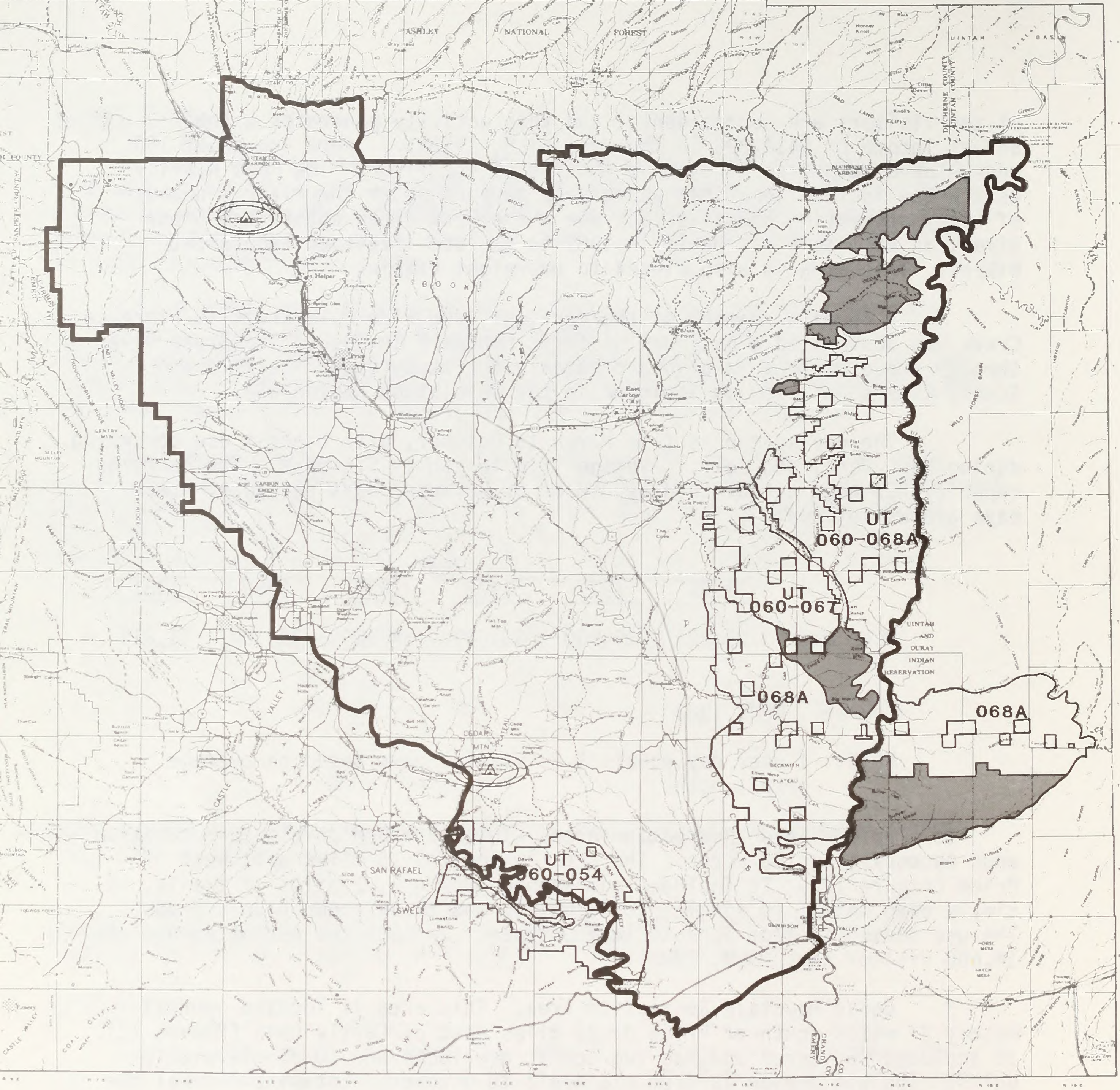

FIGURE 12

WILDERNESS STUDY AREAS AND DEVELOPED RECREATION SITES

☐ WILDERNESS STUDY AREAS

UT 060-054
MEXICAN MOUNTAIN

UT 060-067
TURTLE CANYON

UT 060-068A
DESOLATION CANYON

▨ AREA UNDER APPEAL

DESOLATION CANYON

◎ DEVELOPED RECREATION SITES

N

5 10
MILES

allowed on the Range Creek elk herd or the San Rafael antelope herd. During the period from 1976 to 1980, the average number of hunters afield on these units and the percent of local hunters were as follows:

Animal	Herd Unit	Hunters Afield	Residence of Hunters
Deer	27B	1,960	50 percent from Carbon County
Deer	29	461	33 percent from Emery County
Deer	32	3,779	66 percent from Carbon, Emery counties
Deer	33	902	50 percent from Carbon County
Elk	12	7,782	Not Available
Elk	22	55	Not Available
Antelope	11	11	Not Available

Source: UDWR, 1981

Hunters spent an average of 28,408 hunter days pursuing deer, 39,185 hunter days in pursuit of elk and 20 hunter days hunting antelope annually. Hunting for moose, and bighorn sheep has not been authorized in the EIS area.

Hunters also spent 10,322 hunter days in pursuit of small game in the EIS area.

Wilderness

The PRRA includes all or part of three WSAs as designated in the Intensive Wilderness Inventory Final Decision (BLM, 1980) or as amended in response to public comment or protest. Also included is a 51,220-acre area adjacent to the Desolation Canyon WSA which is currently under appeal. The WSAs are: UT 060-054 Mexican Mountain, 59,600 acres; UT 060-067 Turtle Canyon, 33,690 acres; and UT 060-068A Desolation Canyon, 250,750 acres (Figure 12). Of the total 344,040 acres designated as WSAs, approximately 264,260 acres are within the PRRA (BLM, 1982). The designated WSAs and area under appeal are managed under BLM's IMP, which restricts construction of some types of range developments and certain types of maintenance activities. This management would continue until resolution of the appeal or designation of any of these areas as wilderness or nonwilderness.

Cultural Resources

In 1977 Archeological-Environmental Research Corporation, under contract with the U.S. Department of the Interior, Geological Survey (USGS), prepared a report on cultural resources for the Central Utah Coal EIS (Hauck, et al., 1977). This report included the results of a literature search and field survey on an area that included the PRRA. The survey was a 1 percent random sample of one-quarter-section (160-acre) quadrants stratified according to vegetation types. This study identified 253 sites including 173 previously recorded sites and 80 new sites in the Resource Area. About 83 percent of these sites are lithic scatters or campsites; only 12 percent are structural. The sites are predominantly on mesas and ridge tops and along canyon walls. Sites are located most frequently (60 percent) in the pinyon-juniper vegetation type and secondly (21 percent) in the desert shrub type.

The majority of sites that were identified as to cultural affiliation are Fremont Indian. The sites vary in condition, and erosion is the most common (56 percent) agent of deterioration. Livestock grazing was identified as being at least partially responsible for deterioration on 4 percent of the sites (BLM, 1982).

Two sites on public lands within the Resource Area have been listed in the National Register of Historic Places. The 45-mile section of Desolation Canyon from Nine Mile Creek to Florence Creek and 1 mile on either side of the centerline of the Green River was listed November 24, 1968. The Flat Canyon Archaeological District was listed December 12, 1978. This is a 310-acre area where Flat Canyon enters the Green River.

Socioeconomics

The social and economic effects of grazing in the EIS area are mostly confined to Carbon County and the northern half of Emery County. Over 80 percent of the operators live in the PRRA; the remaining operators live in southern Emery County or in areas outside the Moab District. The region's major service center, Price, is located in Carbon County. Many economic and demographic statistics are available by county only. For this reason, the affected region has been expanded to include all of Carbon and Emery counties.

Economics

Growth and decline in the affected area, particularly Carbon County, are linked with the coal industry. Currently, the industry is expanding rapidly. The region's population has increased 62 percent between 1970 and 1980 (Table 12), and Emery County has the highest rate of growth in Utah (USDC, 1981a). The mining industry is the largest employer, and accounts for the largest share of income earned in the region (see Table 13). The construction and operation of electrical generating plants also provide a large share of employment in the area. The local income and employment attributable to these power plants is reflected in the construction, public utilities, and mining sectors. A number of other businesses depend on the mines and power plants to purchase their products, and many retail and service businesses depend on the workers' local expenditures.

TABLE 12

Population Estimates for Carbon and Emery Counties

Year	Carbon	Emery	Total
1970[a]	15,647	5,137	20,784
1980[a]	22,350	11,650	34,000
1981[b]	23,200	12,100	35,300

[a] USDC, 1981a
[b] Utah, 1982

TABLE 13

Income and Employment in Carbon and Emery Counties (1979)

Sector	Employment	Income In $1,000s
Farm		
Proprietors	557	941
Other	76	446
Private		
Agricultural Services, Forestry and Others	a	a
Mining	4,226	111,179
Construction	1,185	29,666
Manufacturing	338	4,002
Public Utilities and Transportation	a	a
Wholesale Trade	a	a
Retail Trade	1,696	15,561
Finance, Insurance and Real Estate	290	3,683
Services	a	a
Government	2,659	24,416
Total	14,900	237,929

Source: BEA, 1981a and 1981b

[a] Not shown to avoid disclosure of confidential data.

The livestock industry would be most affected by the various alternatives. The alternatives' effects on wildlife in the area and on recreational boating along the Green River have also been identified as having possible social and economic impacts. The economics of salinity in the Colorado River are discussed in the watershed section.

Agriculture: Growth associated with coal mining and electrical generation has indirectly affected ranching in the area. The high wages in these industries and the low agricultural wages, approximately $2,100 annually per worker (BEA, 1981a), have drawn labor from agriculture. The number of people employed in agriculture who listed their principal source of income as other than agriculture increased 46 percent between 1974 and 1978, see Table 14 (USDC, 1981b). Presently, only 35 percent of the livestock operators in the EIS area are full-time ranchers. In addition, population growth has encroached on agricultural land. The increased value of agricultural land near urban areas has tempted some ranchers to sell all or part of their land. Since 1971 the amount of private farmland in the region has decreased by 31 percent (USDC, 1977 and 1981b). As the mining sector grows, more agricultural land and water are expected to be converted from agricultural to residential and industrial uses.

TABLE 14

Principal Occupation and Acres of Private Farms

	1971	1974	1978
Principal Occupation			
Farming	---	249	185
Other	---	251	366
Acres in Private Farms	663,819	582,238	459,867
Percent Decrease	---	12	21

Source: USDC, 1977
USDC, 1981b

There are 88 livestock operators in the EIS area, and of these, 79 are independent operations that have been actively using their grazing privileges. In Table 15 the 79 operators are grouped by type and size of operation and according to their grazing season on public lands. Operators who run both cows and sheep are listed both as a cow operator and as a sheep operator. Of the 79 operators, 73 raise cattle and have an aggregate herd size of approximately 19,560. Ten operators raise sheep and have an aggregate herd size of 8,700. Over 60 percent of the livestock operators have fewer than 100 brood cows, and these operators account for 20 percent of the cattle grazed in the EIS area. Ten percent of the operators have a herd size that exceeds 300 brood cows, and these operators account for over 60 percent of the cattle grazed in the EIS area.

TABLE 15

Livestock Operations and Feed Sources

	Cow, Winter	Cow, Spring, Summer and Fall		Cow Yearlong	Cow	Sheep
Livestock Operations	1-99	1-99	100-299	100-299	300+	
Number of Operators	8	43	5	9	8	10
Average Herd Size	38	41	164	175	862	870
Feed Sources (Percent)						
Public Land	21	35	22	55	35	50
Forest Service	3	0	41	5	0	2
State	6	4	7	4	5	3
Range Lease	18	12	20	5	15	9
Deeded Range	40	27	0	21	29	18
Crop Residue	1	2	1	1	2	8
Hay	10	18	8	8	13	10
Protein Supplement	1	2	1	1	1	1

Source: Gee, 1981

The season of use and dependence upon forage from public land varies considerably among operators. Although the EIS area supplies 38 percent of the forage used by the livestock that graze these public lands, only 22 percent of the forage required by the operators' total herd is supplied by public lands (Gee, 1981; BLM, 1979a). Providing their herd with feed during the spring is a problem for many operators. In early spring many base properties are not yet producing adequate feed, and there are few alternate feed sources available. Generally operators either use hay to supplement their cattle's feed, or use forage from public land. Base property constraints on hay production and the cost of purchasing hay during the spring force many operators to rely heavily on public forage.

The smaller operators (1 to 99 head) generally do not cover their long-term costs, and eventually have to support their ranch investments from outside sources of income (Table 16). Only the larger operators cover their long-term costs and are able to earn a return on their labor and investment. Annual livestock sales from operators who use public land forage are approximately $3 million. Operators hire $120,000 of labor and earn $430,000 toward their labor and investments. In addition to the 79 operators and their families, another estimated 22 people work full- and part-time for ranchers who use forage from the public lands(Gee, 1981; BEA, 1981b). Hired labor for all but the largest operators is part-time. Sheep operations are more labor-intensive and require more full-time workers.

TABLE 16

Summary of Ranch Budgets

Annual Expenditures and Returns (1980 Dollars)	Herd Size					
	Cow, Winter	Cow, Spring, Summer and Fall		Cow Yearlong	Cow	Sheep
	1-99	1-99	100-299	100-299	300+	
Gross Revenue	8,991	10,269	36,078	39,654	191,689	62,280
Total Cash Cost	7,046	8,245	28,454	29,528	130,946	27,554
Returns Above Cash Cost	1,945	2,024	7,624	10,126	60,743	34,726
Returns to Family Labor and Investment	-366	-288	-1,018	1,166	17,405	28,148

Source: Gee, 1981

Operators purchase some supplies for their business locally, and operators and hired labor also spend part of their income locally. The circulation of money through the region contributes to regional income and employment. The estimated totals of these direct, indirect, and induced income and employment effects are presented in Table 17. Total regional income and employment generated from the operators who use public forage in the area is estimated to be $2,008,000 and 161 jobs, respectively. Only part of the 161 full- and part-time employees can be attributed to grazing in the EIS area, as operators depend on public land for only part of their forage.

Grazing fees represent a minimum value for public forage; however, the grazing fee is not determined through the market, and it is generally agreed that the fee is lower than its true economic value (Gardner, 1962; USDA and USDI, 1977). Although the forage quality, season of use, and added services rendered make comparisons between BLM forage and privately leased forage questionable, private lease rates still provide one of the best measures of value. Utah's private lease rate averaged $7.24 per AUM in 1980, and in the PRRA ranged from $6 to $10 in 1982 (USDA, 1981; and Tom Behling, Carbon County Agricultural Extension Specialist, personal communication, May 1982). Using the $7.24 figure, the estimated value of livestock forage provided by the PRRA is $228,707 (see Table 18).

Although BLM does not recognize a capitalized value for grazing preferences, the market does recognize such a capitalized value whenever grazing fees are lower than their true economic value (USDA and USDI, 1977). According to Tom Behling, recent permit sales range from $50 to $70 in the PRRA. These capitalized values could affect the operators' base property value and their ability to borrow money.

TABLE 17

Income and Employment in Carbon and Emery Counties from Activities in the Price River Resource Area

	Economic Sector					
Activity	Agriculture	Wholesale	Retail and Finance	Services	Other	Total
Livestock Operations[a]						
Employment	120	4	20	10	7	161
Income[b]	$1,244,000[d]	$76,000	$ 444,000	$104,000	$140,000	$ 2,008,000
Boating on Green River[a]						
Employment	---	---	11	20	5	36
Income[b]	---	---	$ 162,000	$112,000	$102,000	$ 376,000
Hunting[a]						
Employment	---	2	68	30	7	107
Income[b]	---	$43,000	$ 939,000	$517,000	$135,000	$ 1,634,000
Total for Carbon and Emery Counties[c]						
Employment	557	e	1,986	e	e	14,900
Income	$1,387,000	e	$19,244,000	e	e	$237,929,000

---

[a] Estimated using the Forest Service IMPLAN system (USFS, 1982).

[b] All dollar figures equated to 1979 dollars using Gross National Product deflator factors.

[c] BEA, 1981a and 1981b.

[d] Figure represents return above cash costs, which is higher than reportable income.

[e] Figure not shown to avoid disclosure of confidential data.

TABLE 18

Estimated Wildlife, Livestock Forage, and
Boating Values in the Price River Resource Area
(1980 Dollars)

Wildlife	Hunter Numbers[a]	Estimated Average Hunter Value	Total Hunter Value
Antelope	11	$20[b]	$ 220
Elk	7,837	$53[c]	$ 415,361
Mule Deer	7,102	$42[c]	$ 298,284
Small Game	10,322	$11[c]	$ 82,576
			$ 796,441

Livestock	Licensed AUMs (5-Year Average)	Estimated Average Value Per AUM[d]	Total Forage Value
	31,589	$7.24	$228,707

Boating	Number of Passenger Days	Estimated Average Value Per Passenger Day[a]	Total Boater Value
	33,000	$23	$759,000

[a] UDWR, 1979. Includes all hunders in herd unit including those hunting outside the PRRA.

[b] BLM, 1979a.

[c] USFS, 1980. RPA values were adjusted from value per visitor day to value per hunter.

[d] USDA, 1981.

There is some uncertainty as to how much of a permit's value, if any, is capitalized in an operator's base property when it does not represent actual ranch capacity (Winter, 1981). Although most operators have purchased their grazing privileges from other operators, the uncertain nature of both future grazing privileges and grazing fees after 1985 may have reduced or eliminated much of the previously capitalized value.

Most credit institutions base loans on the ability of the ranchers to repay. The repayment ability is usually measured by the rancher's likely future income. Credit institutions also require a security on their loans which is often based on the base property's appraised value. Although other factors are of far greater importance, the appraised value occasionally includes grazing privileges on public lands. If the ability to repay a loan is adequate, the appraised value could limit the size of the loan.

Wildlife: Hunters contribute to the local economy through their hunting related expenditures. The primary game species hunted in the PRRA are antelope, mule deer, elk, and upland game. Based upon an average local expenditure of $21 per visitor day for big game hunting and $8 per visitor day for small game hunting, the total direct, indirect, and induced income and employment effects are estimated to be $1,634,000 and 107 jobs, respectively (see Table 17). These estimates assume that local hunters who hunt in the PRRA would hunt outside the PRRA were it not for the PRRA's wildlife. To the extent that this is not true, the sales, employment, and income figures are overestimated.

Income and employment measures are useful to gauge the regional significance of an activity; however, they are not the appropriate measures of an activity's value. For commodities that are not sold in the marketplace, value is normally defined as the amount an individual, group of individuals, or a business is willing to pay, over and above the cost incurred to obtain the commodity. Based upon the U.S. Department of Agriculture, Forest Service (USFS) deer, elk, and small game Resource Planning Act (RPA) values and travel cost derived values for antelope, approximately $796,441 of value is generated from hunting wildlife on herd units at least partially in the PRRA (see Table 18). Wildlife also have aesthetic values that have not been quantified.

Recreation on the Green River: Boaters who use the Green River contribute to the local economy through their boating related expenditures. Of the 6,000 boaters who use the Green River each year, 2,400 go as private parties. Using USFS expenditure estimates for dispersed recreation users, and assuming that 75 percent of the boaters' expenditures before and after their trips are made in the region, it is estimated that they contribute $30,000 worth of sales to the region (USFS, 1982). Of the 3,600 boaters who hire river outfitters, 550 purchase the services of local outfitters. River outfitters charge an average of $400 per boater. Assuming that commercial boaters also spend one-half day in the region both before and after their river trip, it is estimated that they contribute $200,000 worth of sales in the region. Commercial river operators from outside the region purchase the services of a local aviation company to fly their customers to the launch sites. The aviation company employs from 5 to 7 people, and depends on these flights for 30 percent of its business.

The local private boater, commercial boater, and aviation sales directly generate $117,000 of income and 20 jobs (USFS, 1982). The number of jobs may be underestimated, due to the large number of temporary jobs associated with river outfitters; however, the income estimates should be fairly accurate. The total direct, indirect, and induced income and employment effects to the region are estimated to be $376,000 and 36 jobs, respectively (see Table 17). Although the income and employment figures are not regionally significant, they may be significant to small communities within the EIS area, such as Green River, and to individual companies, such as commercial river operators.

Income and employment measures are useful to gauge the regional significance of an activity, but they are not the appropriate measure of an activity's value. Using the travel cost technique, the total net value of boating on the Green River in the EIS area is estimated to be $23 per day for a total annual value of $759,000 (Table 18).

Social Conditions

The lifestyle, infrastructure, and impacts from growth and energy related developments in Carbon and Emery counties have been well documented in EISs prepared for power plants and coal leasing in the area (BLM, 1977; BLM, 1979b; USGS, 1979; BLM, 1981a). The actions proposed in this EIS are not expected to significantly affect population or infrasturcture; therefore, these elements will not be further described. A more complete discussion of social values may be found in the Price River Planning Area Analysis (BLM, 1979a).

An opinion study conducted in 1975 indicated that Carbon and Emery county residents valued the rural atmosphere and the area's small population, but were not committed to community stability and favored more growth. About 68 percent said they would move "only if they had to." They also favored expansion of the coal industry and related developments (Albrecht, 1975). There is evidence that this attitude is changing after 7 years of significant energy developments and growth. Now, many residents would favor some controls on further environmental exploitation and associated growth (BLM, 1979a).

Local residents value the opportunity to control their lives and make their own decisions about lifestyles and local government. The Federal Government is often perceived as an organization that regulates and is domineering over basic cultural interests and lifestyles. Some distrust of the BLM regarding grazing management and "locking up" public lands for wilderness has been expressed. Water and its uses are also major concerns to many residents.

Those residents who use the area for grazing would like to see the area remain rural, especially in Emery County where residents have been more associated with ranching and agricultural enterprises. Ranching and grazing of livestock on public lands remains important to individuals, even though the future contributions of the local livestock industry to the local economic base may not be substantial. Livestock operators highly regard their operations and the fact that their ranches provide food and work alternatives for themselves and their families.

Stockmen are generally supportive of concerns for preserving watersheds, vegetation, and wildlife. Some do feel that BLM planning fails to reflect the insight of operators, and that often they are not genuinely listened to.

Residents value hunting opportunities, and generally support transplants of bighorn sheep and expansion of local antelope herds. The preservation of wildlife habitat and maintenance of existing wildlife is a concern of many. Local opinion regarding wild horses in the area is divided. There is some antagonism toward preservation of wild horses, and some residents favor elimination of wild horses where they conflict with wildlife or livestock grazing. Some younger residents have indicated an interest in preservation of wild horse herds.

Most local residents value the recreational opportunities that the area provides, such as fishing, hunting, floatboating, picnicking, and off-road (ORV) use. Many are concerned about widespread ORV use and feel that BLM should control it more on public lands. There is also some concern about the impacts of boaters on soils, vegetation and water quality in Desolation Canyon. Others are concerned about conflicts of livestock grazing with recreational use along the Green River.

CHAPTER 3

ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

This chapter discusses the environmental consequences that would result from implementation of the alternatives. As directed in Section 1502.16 of NEPA, the chapter presents the scientific and analytic basis for a comparison of alternatives described in Chapter 1. For analysis purposes the chapter is divided into alternative sections with resource components as subdivisions. These alternatives and components are discussed in the same order as they appeared in Chapters 1 and 2.

The impact discussion in this chapter does not analyze all of the intricate aspects of the total ecosystem of the PRRA. As provided for in Section 1502.2(b) of NEPA, the discussion presented here focuses on those impacts that are considered significant, i.e., those that affect the quality of the human environment, are controversial, or affect a legally protected species or resource. An exception may be made if a potentially significant impact was raised as an issue during the scoping process. In these instances the potential impact is addressed, although the conclusion may be that no significant consequences would occur.

The EIS team did not identify any change agents in the proposed alternatives that would have impacts on climate, air quality, geology, minerals, paleontology, topography, urban land use, or visual resources. Therefore, no further discussion of these resource components will appear in this EIS.

The environmental consequences that would occur are short-term and long-term. Short-term or initial impacts would occur within 5 years as a result of implementation of initial actions. Long-term impacts are those that would result within 5 to 20 years or beyond from long-term components of the proposed actions (or carry over from initial actions). It is assumed that standard operating procedures and mitigating measures described in Chapter 1 would be implemented; therefore, all adverse impacts described are considered to be unavoidable. The chapter will also discuss, where appropriate, the relationship between short-term uses of man's environment and the maintenance and enchancement of long-term productivity, any irreversible or irretrievable commitments of resources, and natural or depletable resource requirements and conservation potential of the alternatives.

ASSUMPTIONS AND ANALYSIS GUIDELINES

Certain assumptions have been made in analyzing the environmental consequences of implementing the alternatives. The following basic assumptions will apply to all analyses in this chapter; assumptions specific to individual resource components are included in those respective sections.

1. Each alternative is analyzed as if it would be fully implemented and forage allocated would be fully utilized. Monitoring and studies would be carried out as described in Chapter 1.

2. Standard operating procedures would be carried out as described in Chapter 1. Those impacts that would be avoided or mitigated through the Standard Operating Procedures in Chapter 1 will not be discussed in this chapter.

3. The Bureau would have the funds and personnel available to implement the selected alternative.

4. The proposal would exercise control of intermixed State and private lands only to the extent provided in existing and/or future exchange of use agreements between the State, the livestock operators, and BLM. Impacts to State and private lands will not be treated separately in the analysis; however, it is assumed that impacts would be similar to those identified for public lands.

5. The proposal would not involve any direct BLM control over private lands that are intermixed within the livestock allotments, where exchange of use agreements do not exist.

6. Due to the difficulty of predicting future livestock market conditions, an assumption that current market conditions would prevail is necessary for socioeconomic analysis. Any future changes in livestock market conditions would be a result of variables outside the proposed action discussed in this statement.

7. Assessment of impacts is based on expectations of near-normal annual precipitation. Severe climatic variations could drastically alter projected vegetation responses.

8. It is assumed that the permittees would use all AMs allotted to them and, if necessary, purchase additional livestock to use any increase in BLM permits.

9. Livestock operators would have up to 5 years to adjust their ranching operations to coincide with any adjustment of livestock use greater than 10 percent. Final levels of grazing use would be adjusted based on utilization, actual use, trend, and climatological data.

10. It is assumed that big game numbers would be managed by the Board of Big Game Control to meet the population level that could be carried by the available forage in each alternative and that big game populations would increase to that level.

11. Baseline data for vegetation condition, trend, and production is the most reliable data currently available. Available data was used whenever it was applicable and extrapolated to areas for which no data was available.

12. A worst-case analysis is used where (1) the information relevant to adverse impacts is essential to a choice among alternatives and (2) information essential for analyzing those impacts is lacking.

13. AMPs would be written and fully implemented, and an EA covering the AMP would be prepared. The plans would be monitored and evaluated following implementation so that periodic adjustments, if necessary, could be made on those plans not meeting multiple use objectives. Adjustments would be based on utilization studies, actual use data, trend, condition, etc.

14. Land treatments and wilderness-impairing range improvement projects would not be developed in designated WSAs until a final decision on the areas' wilderness status has been made.

IMPACTS OF THE ALTERNATIVES

ALTERNATIVE A - ENHANCE LIVESTOCK PRODUCTION

Vegetation

This alternative provides the maximum livestock forage on a sustained yield basis. If fully implemented, this alternative would exceed the present grazing preference for cattle and sheep on an areawide basis. Generally, ecological condition would improve, as would the vigor of key forage species. Some high value, high use sites would continue to deteriorate.

Range Condition

Ecological condition in the area would improve as a result of the following actions: dual use of the range by cattle and sheep, change in season of use, development of grazing systems, and adjustment of stocking rates. Some continued deterioration could be expected in some high use areas.

Dual use by cattle and sheep would benefit the range and result in higher meat production than single use (Stoddart, Smith, and Box, 1975). Each species utilizes certain plants and topography more readily than the other; therefore, more uniform distribution can be achieved under dual use than under single use. Sheep use forbs and browse more than cows do. Sheep make extensive use of grass only in the spring and early summer. Cattle utilize grasses more than they do forbs or browse. Cattle will utilize browse in the fall and winter, but will graze palatable grasses at that time if they are available. The more uniform utilization would eliminate the competitive advantage gained by some plants under single use. On mixed grass and shrub range, dual use would graze both shrubs and grass so that neither would have a competitive advantage.

The proposed season of use changes would probably benefit areawide range condition more than would any other action. The start of the growing season is the most critical time to the plant. Grazing at this time, particularly on arid ranges, is detrimental to the plant (Stoddart, Smith, and Box, 1975; and Richard Stevens, Biologist, UDWR, personal communication, June 1982). The effects of season of use changes are discussed further under individual vegetation types.

The grazing treatments would improve vegetation vigor and condition. Impacts are discussed in general terms here. Where appropriate, more detailed information will be given under the discussion of individual vegetation types.

Treatment 1. Rest from livestock grazing for 4 consecutive years. This treatment would allow reproduction and establishment of trees and large shrubs and would be applied every 15 to 25 years. Fast growing plants like aspen, willow and cottonwood would grow to the point where the apical meristems (growth points) are above the reach of cattle.

Treatment 2. Rest from livestock grazing for 2 consecutive years. This treatment would benefit all key plant species. It would be beneficial to the mountain browse type by promoting seed production on 2-year-old woody growth and providing trampling of the seed. Two years' rest would allow the other key species to increase in vigor, seed production and seedling establishment (Hormay, 1970).

Treatment 3. Rest from livestock grazing from the spring of one year until midsummer of the following year. This would provide two growing seasons of rest. Effects would be similar to Treatment 2, but some shrub reproduction would not be favored as much as under Treatment 2 because some browse species do not produce seed until after midsummer. These include: shadscale, Bigelow sage, fourwing saltbush, winterfat, big sagebrush, cliff rose, birchleaf mahogany, gambel oak, curlleaf mahogany, bitterbrush, Woods rose, and chokecherry.

Treatment 4. Livestock grazing midsummer through fall. This treatment would provide for seed dispersal and trampling. When coupled with spring and early summer rest, this treatment would allow an increase in plant vigor and grass seedling establishment.

Treatment 5. Rest for 2 consecutive years until plants are established or until it is determined that a vegetation manipulation project has failed. This would allow for seedling establishment and development of vigor after vegetation manipulation projects.

Treatment 6. Livestock grazing in the winter. This treatment would remove herbage when the plants are dormant. It would be beneficial to all non-evergreen plants that reproduce on first year's growth, assuming that grazing is at or below established proper use levels.

Treatment 7. No livestock grazing. This would eliminate all domestic livestock grazing impacts on vegetation.

Treatment 8. Spring livestock grazing. This treatment would decrease grass and forb production and reduce the competition between herbaceous plants and shrubs. This would favor shrub production.

The reduction of livestock numbers to capacity would improve range condition. This improvement would be most noticeable and effective on large areas of fairly uniform production. The reduction would probably not improve highly utilized sites such as riparian and wet meadow areas. Even reduced numbers of animals in these areas would continue to congregate on these sites. Lowered stocking rates would only slow the rate of deterioration.

Vegetation Types

Riparian Areas: Development of grazing systems incorporating Treatments 1, 2, 3, and 4 may result in a long term improvement in condition of riparian sites. These treatments would be beneficial for riparian areas compared to continuation of the existing situation. The rest provided would increase plant vigor and possible stabilization of some areas. But, when the livestock are again allowed to graze these areas, they would congregate in riparian areas and utilize most of the available vegetation before moving to less desirable areas on steeper slopes or farther from water (Martin, 1979). If the above treatments are not implemented, the long-term improvement of riparian areas would not occur.

Actions proposed in this alternative would reduce the impacts on riparian areas and offer slight improvement; however, riparian areas would continue to degrade, and a long-term loss of riparian vegetation would occur.

Aspen: Where Treatment 1 is applied, aspen groves would increase in size and density because root suckers would grow out of reach before domestic livestock reenter the area. This is the only grazing treatment, other than total exclusion, that would assure propagation of aspen. If the treatment is not applied no improvement would occur, and those accessible stands that are presently degraded would continue to deteriorate, but at a slower rate than at present. Like riparian areas, aspen areas are congregation areas and would be overutilized before adjacent areas were moderately grazed.

Wet Meadows: Wet meadows would be benefited by Treatments 1, 2, 3, 4, and 6. Changes in season of use would have a beneficial impact. Mountain areas would be grazed after midsummer and alkali meadows in the winter. Meadow vegetation has made most of its growth by midsummer and is dormant in winter. Livestock, especially cattle due to their weight and relatively small hoof area, tend to punch in the sod of meadow areas. Later turnout in the mountains would allow grazing when the sod is drier and more resistant to trampling damage. Alkali meadows are usually frozen in the winter and thus are not as susceptible to trampling damage.

Mountain Browse: Mountain browse would benefit from any system that would provide at least 2 years' rest. Change in season of use would benefit this type in the Consumers Wash, Porphyry Bench, Pinnacle Bench and North

Spring Allotments. These are presently grazed by sheep in fall and/or winter. The proposed spring and early summer grazing would help browse production by concentrating domestic livestock use on grasses and forbs. Production of mountain browse may increase if mountain browse species are planted during chaining projects in the pinyon-juniper woodland. This technique was very successful in the Coal Creek seeding north of Price.

Pinyon-Juniper Woodland: The pinyon-juniper woodland would decrease in size under this alternative as a result of chaining. Chaining opens the stand, releases understory vegetation, and allows herbaceous seedling establishment. According to the SVIM data, pinyon-juniper sites with over 1,500 trees per acre and virtually no understory can produce 30,000 perennial grass plants per acre after chaining. Under this alternative, 37,300 acres of previously untreated pinyon-juniper woodland would be chained. Along with increased herbaceous plant production, browse species would also increase in density if planted in the chained areas.

Salt Desert Shrub: This type would be benefited primarily by the change in season of use from spring to winter. All the key plant species would be benefited by this change. On allotments that are presently grazed in the spring, the vigor and density of cool season grasses, winterfat, and forbs would increase. These ranges can improve while being grazed at a moderate rate in early and midwinter. Repeated grazing in the spring is damaging (Holmgren and Hutchings, 1972; Ellison, 1960; Cook, 1977). Adjustment of stocking rate in conjunction with the season of use changes would also benefit this vegetation type.

Sagebrush-Grass: This type would be decreased in size as a result of vegetation manipulation (6,746 acres of herbicide spray, 1,150 acres prescribed burn, and 3,098 acres of plowing and seeding).

This would result in the conversion of a predominantly sagebrush type to a dominant grassland type. Research in northern Utah showed an average increase in herbaceous forage yield of 166 percent after spraying (Cook, 1963). Hyder and Sneva (1956) in Oregon found a 200 percent increase in forage and a four fold increase in cattle gains.

Spraying herbicide is an effective controlling agent for big sagebrush. It is likely to be used in the future because of its relatively low cost, predictability and considerable practical experience with the technique. While the herbicide of choice, 2,4-D does not harm grasses, Keith, et al. (1959) reported an 83 percent reduction of perennial forbs in the year after the spray project. Laycock (1979) reported that forbs returned to their former abundance, and sometimes increased abundance in 5 to 19 years after the spraying.

Some plants have been found to develop toxic levels of potassium nitrate after application of 2,4-D. Mustard, pigweed, and lambsquarter (Olson and Whitehead, 1940; Berg and McElroy, 1953; Whitehead et al., 1956) are found in the EIS area and could develop levels toxic to cattle. Application of Treatment 5 should prevent any nitrate toxicity problems.

Sagebrush is very vulnerable to fire, and prescribed burning is known to be an effective control. Prescribed burning usually results in an increase in grass and forb production. If the fire is extremely hot, all vegetation is killed, and reseeding is necessary. Prescribed burning usually results in a more natural looking, mottled pattern on the ground. Desirable forage plants that are susceptible to fire damage, including curlleaf mahogany, cliff rose, bitterbrush, and Thurbers needle grass, could be eliminated or reduced.

Areas containing rubber rabbitbrush or cheatgrass can be invaded by those species after a fire. The problem is worsened when livestock use the burn area in the first year after a fire. Treatment 5 should be applied after any fire, whether prescribed burn or wildfire.

Condition of the sagebrush grassland would be improved by any treatments providing rest during the spring. The proposed season of use for most of these ranges commences after the flowering of key grass species.

Vegetation Manipulation Areas

Under this alternative, existing vegetation manipulation areas (32,100 acres) would be maintained. Reinvasion of woody species would not occur. Impacts caused by maintenance operations would be similar to those previously described for new projects.

Endangered and Sensitive Plants

No adverse impacts are expected on endangered and sensitive plants identified in the area. Surveys and avoidance of any plants that could be adversely impacted by ground-disturbing projects would effectively avoid any adverse impacts.

Livestock Grazing

Table 19 shows the change in AMs from preference and average licensed use for the three allotment categories. Fifty-one allotments would receive an increase in cattle grazing preference, while 66 would be decreased. Areawide, sheep AMs would increase 141,912 AMs from active preference. Cattle AMs would increase 9,129 from average licensed use, but decrease 5,641 from active preference levels. A net increase of 4,551 cattle AMs above active preference would be available after vegetation manipulation projects are completed.

Season of use changes on 85 allotments and initiation of season of use on five currently ungrazed allotments would cause operators to change their current operation on those allotments.

TABLE 19

Change in Forage Allocation and Number of Allotments Affected, Alternative A

					Number of Allotments Affected			
					Increase		Decrease	
Allotment Category	Animal	Active Preference (AMs)	Average Licensed Use (AMs)	Proposed Allocation (AMs)	From Active Preference	From Average Licensed Use	From Active Preference	From Average Licensed Use
M	Cattle	2,969	1,987	3,129[a]	9	13	7	3
	Sheep	4,930	1,121	15,568	14	15	2	1
I	Cattle	37,971	25,339	30,545[b]	26	35	37	27
	Sheep	33,250	4,859	128,011	47	56	13	4
C	Cattle	4,136	2,980	5,761	16	22	22	14
	Sheep	2,775	437	29,288	32	33	6	4
Area-Wide Totals	Cattle	45,076	30,306	39,435	51	70	66	44
	Sheep	40,955	6,417	172,867	93	104	21	9

[a] Does not include 760 AMs gained from proposed vegetation manipulation

[b] Does not include 9,432 AMs gained from proposed vegetation manipulation

Wildlife

The analysis of grazing systems and treatments is common to alternatives A and B.

Grazing Systems and Treatments: Although no grazing systems are proposed in this EIS, specific grazing treatments which will eventually be used to make up these systems can be evaluated as to their impact on wildlife. Treatments 1 through 8, as described in Chapter 1, will be discussed individually or jointly as they impact different wildlife species.

1. Treatments 1, 2, and 3

Treatments 1, 2, and 3, varying periods of rest from livestock grazing, would generally benefit all major grazing wildlife species. This treatment could greatly enhance summer and winter ranges of mule deer, elk, and moose, as well as improve antelope yearlong range by increasing forb production and vigor. This treatment could adversely impact these ranges if the treatment allowed nonbrowse species a competitive advantage.

2. Treatment 4

Treatment 4, livestock grazing from midsummer through fall, would adversely impact winter and critical winter ranges of mule deer, elk, and moose. Antelope yearlong ranges in the Icelander herd would generally be benefited by reducing grazing pressure on forbs and allowing increased establishment. Sage grouse ranges, particularly brood rearing areas, would also benefit.

3. Treatment 5

Treatment 5, 2 consecutive years' rest until plants are established or until it is determined a manipulation project has failed, would be used only in conjunction with a vegetation manipulation project. This is essential to the success of vegetation manipulation projects and establishments of plants seeded to improve wildlife habitats.

4. Treatment 6

Treatment 6, winter grazing, would be detrimental to all mule deer, elk, and moose winter and critical winter ranges. Livestock would compete directly for high-value browse crucial to the winter maintenance of these species. Over the long term, nonbrowse species would be favored, resulting in decreased production of high-value browse species. Yearlong ranges of the Icelander antelope herd could be impacted in a similar manner as stated for mule deer. However, high-value browse is not believed to be limiting for most of the Icelander herd.

5. Treatment 7

Treatment 7, no livestock grazing, would benefit desert and Rocky Mountain bighorn sheep populations. Competition for forage, water, and space would be removed, as would the potential for disease transmission. Mule deer would be adversely impacted over the long term, as important winter ranges would become grass dominated. The carrying capacity for mule deer would be reduced.

6. Treatment 8

Treatment 8, spring grazing, can be highly beneficial to mule deer and elk winter and critical winter ranges. Winter ranges which have not been grazed for long periods of time or have been grazed in fall and/or winter (allowing grass species to gain a competitive edge) would benefit greatly. Late spring grazing, particularly by cattle, is believed to improve vigor and production of many browse species (Jensen, et al., 1972).

Major Grazing Wildlife Species: Present wildlife population levels were used to determine the level of forage allocation. No restrictions would be imposed on livestock grazing. Wildlife introductions would be permitted only where no impacts to livestock grazing are expected.

Mule Deer

Forage Allocation: Forage allocation would adversely impact all mule deer herd units in the Resource Area. Prior stable population levels (MFP Step 1 Objective) for herd units 27B and 32-33 could not be met in the short (5 years) or long (20 years) term. The current population estimate for herd unit 27B is 4,902 deer (43 percent of prior stable) and for herd unit 32-33 it is 11,353 deer (87 percent of prior stable). Allotment-specific quantification is presented in Table 20 showing actual AMs available for mule deer for this and each alternative as compared with present population AM demand.

As can be seen through analysis of Table 20 a conflict exists in that sufficient AMs would not be available to meet present demand on 85 (72 percent) allotments containing mule deer habitat. Total available AMs under this alternative would be 65,765 or 51 percent of the present demand of 128,136.5 AMs. Allotments containing winter and critical winter range in

TABLE 20

Forage Availability for Each Alternative
and Present Demand for Mule Deer Animal Months

Allotment	Alternative Enhance Livestock Production	 Planning Recommendation	 Enhance Watershed, Wildlife & Recreation	 No Action	Present Demand
Airport	26	103	120	114	364
Allred North	5	105	105	105	6.5
Allred South	12	83	83	82	12
Anderson	12	28	158	28	12
Bear Canyon[1]	116	860	884	188	110
Beaver Creek	380	309	405	397	880
Bench	96	135	112	140	96
Big Spring	12	111	112	343	12
Blind Canyon	195	1,135	1,240	1,187	136.5
Box Flat	256	7,797	7,802	2,770	348
Brown	0	55	55	10	0
Buckmaster	555	12,355	12,395	4,988	624
Buckskin	7	253	253	252	401
Calf Canyon	73	841	838	338	84
Canal Cattle	0	26	26	1	0
Canyon[1]	318	984	984	983	821.5
Cat Canyon	5	114	114	128	24
Chimney Rock Flat	269	6,292	4,435	1,650	612
Church Flat	108	206	206	109	108
Clarks Valley	38	457	530	532	48
Cleveland Summer	463	1,826	1,750	1,761	780
Cleveland Winter	62	847	847	847	96
Closed to Grazing	192	2,142	2,432	2,142	192
Coal Creek[1]	1,054	1,659	2,466	1,178	9,945
Columbia[1]	0	538	770	422	64
Consumers Wash	916	873	1,132	859	3,451.5
Coon Springs	65	2,183	2,296	998	96
Corner	119	324	344	167	1,670.5
Cove[2]	61	2,877	3,052	693	66.5
Cow Canyon	112	440	440	73	621.5
Crandall Canyon[2]	267	278	297	274	1,135
Deadman[2]	83	224	266	232	846.5
Dripping Springs	250	1,890	1,890	1,242	252
Dry Canyon[2]	684	2,083	2,083	2,060	1,272.5
Dugout	56	135	62	152	32.5
Elliot Mountain	397	15,747	14,283	20,256	396
Elmo	22	198	199	198	24

Continued

Table 20 Continued

Allotment	Alternative Enhance Livestock Production	Planning Recommendation	Enhance Watershed, Wildlife & Recreation	No Action	Present Demand
Erramouspe	0	0	2	0	0
Fan Canyon	70	484	483	484	45.5
Farnham	84	299	299	129	84
Fausett	17	43	45	12	637
Fish Creek[2]	99	77	105	19	312
Gordon Creek[1]	1,423	1,448	1,448	1,465	5,265
Grassy Trail[2]	12	107	120	128	12
Green River North[1]	9,849	21,145	23,864	12,987	8,178.5
Green River South	119	4,887	4,914	4,914	132
Haley Canyon	1,569	1,491	1,728	369	2,528.5
Hayes Wash[1]	826	831	505	896	2,026
Hiawatha[1]	508	913	984	511	2,791.5
Huff Bench	43	231	188	181	132
Humbug	647	6,763	3,832	3,688	732
Icelander	766	8,564	8,564	8,881	871
Iriart	56	645	645	370	58.5
Jensen	0	59	59	55	0
Johnson Huff Hollow	91	109	155	105	120
Keel	51	107	104	456	45.5
Kimball Canyon	64	104	104	71	45.5
Kyune I[2]	1,725	3,539	4,607	3,536	6,801
Kyune II[2]	392	760	669	660	3,080
Last Chance	4,666	7,462	6,595	6,022	3,971.5
Lila Canyon	68	357	649	357	71.5
Little Park[1]	2,158	5,002	5,160	4,224	2,410
Long Bench[1]	211	226	248	222	190
Lookoff	51	203	206	204	108
Lucky Lemon Flat	144	2,554	2,555	1,318	228
Marakis	24	33	21	15	44
Marsing	12	257	269	253	12
Mathis Wash	0	819	845	185	48
Max Canyon	20	40	40	62	13
Miller Creek[2]	568	1,267	1,343	735	652.5
Mohrland[1]	919	820	1,042	969	1,609.5
Mounds	13	304	304	17	48
Mud Springs[2]	978	2,792	3,551	4,359	1,146
Mudwater	119	137	137	137	159.5
North Clarks Valley[1]	454	693	1,610	1,500	594
North Hollow	40	259	259	220	26
North Olsen Lake	48	199	199	383	48
North Spring	132	1,163	1,178	1,679	5,421

Continued

Table 20 Continued

	Alternative				
Allotment	Enhance Livestock Production	Planning Recommendation	Enhance Watershed, Wildlife & Recreation	No Action	Present Demand
Oil Well Draw	156	2,563	2,827	1,428	156
Oviatt	12	172	172	174	12
Pace Canyon[2]	107	232	232	203	213
Patmos	84	444	444	259	478.5
Peterson	0	46	47	46	0
Pine Canyon[1]	104	257	257	264	112.5
Pinnacle Bench	130	606	606	546	1,501.5
Poison Spring Bench[2]	456	2,317	2,493	2,049	3,097
Pole Canyon	108	297	297	237	291.5
Porphyry Bench	535	1,158	1.263	1.474	6,331
Price Canyon East[2]	1,239	1,679	1,667	1,563	2,061
Price Canyon West[2]	777	780	916	775	1,741
Price River North	5	45	45	18	12
Price River South	116	342	178	328	216
Range Creek[1]	5,234	5,044	9,229	7,082	3,594
Range Mountain	16	86	93	78	253
Rimrock	78	238	238	197	99
River	1,156	1,610	1,508	3,709	435.5
Rock Canyon	16	273	273	222	52
Rock Creek[1]	9,421	17,878	17,586	11,375	6,949
Sage Flat	0	800	821	731	132
Sheep Canyon[2]	480	1,480	1,480	333	1,091
Smith	24	141	141	33	96
Soldier Canyon[1]	3,267	2,520	3,601	2,495	11,308.5
South Olsen Lake	12	238	238	238	24
Spring Canyon	722	741	741	731	1,562
Staker	12	187	187	187	12
Stone Cabin[1]	1,521	3,021	2,881	2,923	1,266.5
Sulfur Canyon[1]	0	1,386	1,386	381	614.5
Summerville	510	3,731	4,376	3,410	612
Trail Canyon[2]	548	531	645	527	1,207.5
Trail Spring	283	2,944	3,032	460	348
Victor	56	605	628	610	60
Washboard[2]	71	2,994	2,350	477	209
Wattis[2]	537	578	709	681	1,912.5
Wellington	2	76	90	12	24
Wildcat[2]	275	277	301	278	393.5
Willow Creek[2]	298	964	965	908	662.5

Continued

Table 20 Continued

	Alternative				
Allotment	Enhance Livestock Production	Planning Recommendation	Enhance Watershed, Wildlife & Recreation	No Action	Present Demand
Woodhill[1]	377	307	307	307	1,943.5
Woodside[1]	698	4,833	4,684	3,061	513
Total AMs	65,765	208,127	215,035	161.487	128,136.5

NOTE: Forage AMs were increased by 55 percent in allotments with mule deer winter range. This was based on allowing mule deer diets to consist of 50 percent sagebrush species and 5 percent pinyon-juniper. It is assumed that these plant species would not be limiting. Because of their abundance they were not given a proper use factor (PUF) in the forage allocation model.

[1] Includes a 55 percent increase in total AMs. Winter range AMs accounted for 50 percent or more of mule deer AMs.

[2] Does not include 55 percent increase in total AMs. Winter range AMs accounted for less than 50 percent of mule deer AMs.

herd units 32-33 would be the most deficient in available AMs. It should be noted that the proper use level allows mule deer diets to consist of 50 percent sagebrush species (Durant MacArthur, Research Plant Physiologist, USFS; and Dr. Julius G. Nagy, Professor of Wildlife Biology, Colorado State University, personal communication, February 1982). Variation of this single proper use level significantly alters AMs available for mule deer.

Season of Use, Kind of Livestock: Proposed season of use and kind of livestock would have adverse impacts on much of the mule deer habitat in the Resource Area. The most severe impacts would occur on allotments with critical winter and winter ranges where sheep grazing and cattle fall and winter grazing would be continued. Competition for, and heavy utilization of high-value browse species would, over the long term, favor nonbrowse species resulting in reduced carrying capacity for deer. Fecal analysis studies conducted on critical winter ranges in the PRRA showed fall (October to December) cattle diets consisting of up to 50 percent browse on Coal Creek Allotment (BLM, 1982). Domestic sheep compete more strongly for forage with mule deer in all seasons than do cattle.

Vegetation Manipulation: Vegetation manipulation proposed under this alternative would have significant adverse impacts to mule deer winter and critical winter ranges. Moderate/high value thermal cover on mule deer critical winter ranges in critical winter ranges in herd units 32-33 and 27B is sufficient (Table 11 Chapter 2). The chaining of 68,332 acres of pinyon-juniper woodland would further reduce thermal cover for mule deer on those areas. In addition, any forage gains from vegetation manipulation would be given only to livestock.

Cumulative impacts of proposed forage availability, season of use, kind of stock and vegetative manipulations would result in the need for reduction of mule deer in herd units 27B, 29, and 32-33. Without significant reductions, winter ranges in herd unit 32-33 and summer ranges in herd unit 27B would be subject to overutilization of high value browse species. If allowed to continue, high value browse would be lost and mule deer carrying capacity permanently reduced.

Pronghorn Antelope

Forage Allocation: Forage allocation would have significant adverse impacts on antelope populations in the Resource Area. Allotment specific quantification is presented in Table 21 showing AMs of forage available for antelope for this and each alternative as compared with present AM demand. As shown in Table 21, available AMs would be insufficient for present antelope populations in 16 of the 33 allotments (48 percent) containing antelope habitat. AMs available total 3,412 or 66 percent of the present AM demand.

A reintroduction of antelope in herd unit 9 would not be permitted due to possible impacts to livestock grazing.

Season of Use, Kind of Livestock: Proposed seasons of use for livestock grazing, largely winter grazing on high priority antelope range, would benefit antelope forage conditions. Winter livestock grazing would cause grazing pressure on the browse forage component and relieve pressure on the forb component. Forbs make up the most important component of antelope forage requirements for the Icelander herd. Browse, although equally important in the antelope's diet, is less limiting.

Kind of livestock proposed, principally sheep, could adversely impact antelope in the Icelander herd. Domestic sheep diets closely resemble antelope diets, and winter sheep grazing would result in greater competition for browse species than would cattle grazing. Spring sheep grazing would result in competition for forb species that are preferred by antelope through the spring, summer, and fall.

Vegetation Manipulation: All vegetation manipulation, except for chemical treatment, could benefit antelope habitat. Chemical treatment (2,4-D) of vegetative communities, such as control of sagebrush, has been shown to critically impair forb production. The beneficial impacts that can be achieved include increasing vegetative diversity in sagebrush dominated

TABLE 21

Forage Availability for Each Alternative and Present Demand for Antelope Animal Months

	Alternative				
Allotment	Enhance Livestock Production	Planning Recommendation	Enhance Watershed, Wildlife & Recreation	No Action	Present Demand
Airport	0	29	29	29	0
Bench	12	109	169	110	12
Big Spring	24	167	169	499	24
Buckmaster	55	6,345	6,345	4,891	0
Cat Canyon	36	247	247	223	36
Chimney Rock Flat	30	11,594	6,475	1,748	504
Church Flat	108	287	287	259	108
Clarks Valley	115	1,582	1,903	1,824	144
Cleveland Summer	120	1,080	1,081	1,153	204
Cleveland Winter	104	1,716	1,716	1,716	132
Coal Creek	16	439	439	253	12
Coon Springs	101	2,692	2,730	1,294	144
Cove	221	8,174	9,682	1,978	288
Dripping Springs	71	714	714	498	84
Elliot Mountain	139	1,821	3,069	4,521	156
Elmo	22	453	454	453	36
Farnham	120	1,786	1,786	254	132
Grassy Trail	12	156	73	164	12
Hayes Wash	0	476	526	471	36
Humbug	369	6,473	3,865	6,179	396
Icelander	741	13,801	13,801	15,382	852
Mathis Wash	48	745	750	0	48
Mounds	63	789	798	35	72
Mud Springs	1	2,664	3,449	6,062	300
North Clarks Valley	12	89	83	82	12
North Olsen Lake	24	345	345	609	24
Oil Well Draw	228	4,859	4,875	2,660	228
Price River North	9	72	72	20	12
Soldier Canyon	70	539	855	576	108
South Olsen Lake	24	491	491	490	24
Summerville	261	2,349	4,373	990	324
Trail Spring	178	1,845	1,849	203	216
Victor	78	918	965	945	84
Woodside	0	2,493	2,547	2,450	108
Total	3,412	78,830	77,679	59,511	5,196

(30 percent cover) sites and lowering the height of shrub communities that are presently 26 to 30 inches high. Forage gains resulting from the projects would be given to livestock. However, because of the difference in diets, antelope would benefit from increased forage production.

Despite beneficial impacts from proposed season of use changes and vegetation manipulation, the cumulative affect of the proposed action would be adverse for antelope. A significant reduction of antelope in herd unit 11 would be required to avoid overutilization of high value forbs and browse species. Also, with predicted habitat conditions, antelope would not be introduced in herd unit 9.

Elk

Forage Allocation: Forage allocation would adversely impact elk in all three herd units. Present population levels are well below prior stable estimates (See Chapter 2). Allotment specific allocation levels are presented in Table 22, which compares present AM demands with available forage. Animal months available would be insufficient for present demand in 36 of the 54 allotments (66 percent) containing elk habitat. In total, this allocation would provide 50 percent (2,661 of 5,323) of the present AM demand.

Season of Use, Kind of Livestock: Impacts to elk from proposed seasons of use would be similar to those discussed for mule deer. Fall and/or winter livestock grazing on winter and critical winter ranges (proposed for 45 of the 50 allotments containing these ranges) could cause excessive use of browse species. In the long term, this would favor the nonbrowse plant species, reducing the suitability of the allotments for winter and critical winter range.

Impacts to elk from the proposed kind of livestock would also resemble those stated for mule deer, particularly on winter and critical winter ranges.

Vegetation Manipulation: No vegetation manipulation is proposed on critical elk winter range. However, several projects are proposed for elk winter range. All treatments that would reduce canopy cover of pinyon and juniper on winter ranges in the Gordon Creek area would adversely impact wintering elk. As discussed for mule deer, high-value thermal cover is insufficient in this area. Similar impacts, although perhaps not as severe, could be anticipated on other elk winter ranges where canopy cover would be reduced.

Significant herd reductions would be necessary to avoid overutilization of elk habitat if the proposed actions were implemented. This would reduce present herds and prevent expansion of elk into the RC herd unit.

TABLE 22

Forage Availability for Each Alternative and Present Demand for Elk Animal Months

	Alternative				
Allotment	Enhance Livestock Production	Planning Recommendation	Enhance Watershed, Wildlife & Recreation	No Action	Present Demand
Allred North	0	20	20	20	0
Bear Canyon	6.5	228	232	46	6.5
Beaver Creek	79	78	120	90	176
Blind Canyon	6.5	276	295	299	6.5
Buckskin	0	74	74	73	16.5
Coal Creek	81	439	238	314	97.5
Consumers Wash	63	173	213	215	78
Corner	12	38	37	1	13
Cow Canyon	3	90	201	47	17.5
Crandall Canyon	266	306	305	305	981.5
Deadman	14	320	298	320	32.5
Dry Canyon	4	930	930	925	41.5
Dugout	0	183	184	70	0
Fish Creek	20	35	35	37	27.5
Green River North	115	4,665	4,210	2,209	204
Haley Canyon	39	268	174	69	39
Hiawatha	42	112	64	107	52
Iriart	7	121	121	125	19.5
Keel	10	28	16	111	0
Kimball Canyon	10	11	15	15	13
Kyune I	154	1,406	1,407	1,407	345.5
Kyune II	89	419	417	373	160.5
Last Chance	6.5	595	546	508	6.5
Lila Canyon	0	176	179	---	0
Little Park	0	1,696	1,733	1,537	26
Long Bench	13	90	81	92	13
Marakis	0	21	10	10	5.5
Mohrland	3	30	33	41	19.5
Mud Springs	0	21	21	15	0
Mudwater	96	120	120	120	130
North Hollow	6.5	59	59	57	6.5
North Spring	8	55	56	171	26
Pace Canyon	6.5	140	140	82	6.5
Patmos	3	136	137	100	11
Pine Canyon	6.5	133	134	83	6.5
Pole Canyon	1	122	122	92	6.5
Porphyry Bench	0	4	0	3	6.5

Continued

Table 22 Continued

Allotment	Alternative Enhance Livestock Production	Planning Recommendation	Enhance Watershed, Wildlife & Recreation	No Action	Present Demand
Price Canyon East	143	1,613	1,633	1,657	198
Price Canyon West	101	441	365	440	164
Range Creek	67	2,203	2,203	1,881	44.5
Range Mountain	2	16	32	14	11
Rimrock	0	41	113	64	13
Rock Canyon	0	60	36	60	0
Rock Creek	118	6,047	5,851	3,579	123
Sheep Canyon	11	545	545	114	40.5
Spring Canyon	95	425	436	391	491
Stone Cabin	36	1,103	1,607	1,073	44.5
Sulfur Canyon	115	198	191	55	189.5
Trail Canyon	400	174	525	504	687
Wattis	259	368	406	351	481
Wildcat	32	223	212	224	32.5
Willow Creek	107	573	573	573	199
Woodhill	4	10	10	10	6.5
Total	2,661	27,658	27,715	21,079	5,323

Desert and Rocky Mountain Bighorn Sheep

Forage Allocation: Desert and Rocky Mountain bighorn sheep would be adversely impacted by forage allocation under this alternative because of allocations for the very low existing numbers in these populations. Present population levels for these species are less than 5 percent of the prior stable population. Allotment-specific quantification of allocation levels and present demand for this and each alternative are presented in Table 23. Present demand for Rocky Mountain bighorn sheep would be met under this alternative. Present demand for desert bighorn sheep would be met in all but two allotments. Total EIS area demand for desert bighorn sheep is 180 AMs compared to 173 available AMs. Introduction of bighorn sheep would be highly restricted if permitted at all. Cooperative agreements with the UDWR have been signed for future reintroductions, but these may not be permitted if this alternative is implemented.

TABLE 23

Forage Availability for Each Alternative
and Present Demand for Bighorn Sheep Animal Months

		Alternative				
Allotment	Species[1]	Enhance Livestock Production	Planning Recommendation	Enhance Watershed, Wildlife & Recreation	No Action	Present Demand
Box Flat	SE	0	5,348	5,710	2,612	0
Buckmaster	SE	0	888	933	870	0
Calf Canyon	SE	0	117	326	36	0
Elliot Mountain	SE	108	4,582	8,261	8,920	108
Green River North	SR	170	4,230	4,072	2,168	204
Last Chance	SR	274	3,977	4,304	3,404	168
Price River South	SE	12	163	111	175	12
Range Mountain	SR	0	7	7	7	0
River	SE	32	1,302	1,235	3,450	36
Rock Creek	SR	205	4,685	5,214	2,326	240
Woodside	SE	21	779	852	920	24
	SR	24	579	637	585	24
Total	SE	173	13,179	17,428	16,983	180
Total	SR	673	13,478	14,234	8,490	636

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[1] SE indicates Desert Bighorn Sheep
SR indicates Rock Mountain Bighorn Sheep

Season of Use, Kind of Livestock: Little impact is anticipated from proposed seasons of use on desert and Rocky Mountain bighorn sheep. Dual use by cattle and sheep, particularly sheep, would have a major impact to bighorn sheep ranges. Desert bighorn sheep are displaced from suitable habitat occupied by livestock (Dean, 1977). Livestock, especially sheep, are also a potential threat to bighorn sheep populations through possible disease transmission.

Vegetation Manipulation: No projects are planned for desert bighorn sheep habitat, and only a few are proposed for Rocky Mountain bighorn ranges. Impacts to Rocky Mountain bighorns would be favorable if increased diversity of forage is achieved. However, as mentioned earlier for antelope, chemical treatments can severely impact forb production, and this would adversely impact bighorn sheep ranges.

The adverse impacts of the proposed actions, and the restricted reintroduction program would eliminate the establishment of a viable herd on Elliot Mountain, and portions of the San Rafael, and Range Creek herd units.

Moose

Forage Allocation: Moose populations would be adversely impacted by proposed allocation of forage based on present population levels. Present population levels represent only 20 percent of the estimated prior stable level, and population growth would not occur under proposed allocation levels. Allotment-specific allocation levels are listed by allotment in Table 24.

As shown in Table 24, sufficient forage would not be available for present AM demand in all allotments containing moose habitat. However, total AMs available for moose in the EIS area (181) exceeds the present demand of 96 AMs.

Season of Use, Kind of Livestock: Fall and winter grazing is proposed in five of six allotments containing critical moose yearlong range. This season of use could cause depletion of the browse required by wintering moose.

Vegetation Manipulation: No projects are planned for moose critical yearlong ranges. Moose yearlong ranges could be adversely impacted through chemical treatments using 2,4-D. Forb production, which could be reduced, is very important in spring-use areas.

Sage Grouse and Other Upland Game

Season of Use, Kind of Livestock

The proposed season of use would preclude almost all livestock impacts to sage grouse strutting and breeding activities. However, impacts to nesting and brood rearing habitat are anticipated from the proposed season and kind of livestock. These impacts would include removal of brood cover and important forbs in meadows, disturbance of nesting hens, and possible nest trampling. The most critical of these impacts would be removal of brood cover and important forbs on which young sage grouse (4 to 8 weeks) depend. Cattle grazing during the proposed season, particularly June 1 to June 30, would significantly reduce available forbs necessary for young grouse. Domestic sheep grazing during the same period would have an even greater impact on forb production. The reduction of the forb component in critical sage grouse ranges would make them less suitable.

Wet meadows, of critical importance to sage grouse for brood rearing habitat, would be adversely impacted. However, these impacts could be mitigated through implementation of grazing systems. Invasion of sagebrush into these areas, as described in the vegetation narrative, could result in eventual loss of these areas. Sage grouse populations would be reduced as existing range becomes less suitable.

Impacts to ruffed and blue grouse would be similar to those described for sage grouse, but their nesting/brooding areas are believed to be more widespread and the impacts would therefore be less severe.

Vegetation Manipulation

Five proposed projects in Green River North Allotment and one in Rock Creek Allotment all totaling 1,577 acres of sagebrush treatment (approximately

TABLE 24

Forage Availability for Each Alternative and
Present Demand for Moose Animal Months

	Alternative				
Allotment	Enhance Livestock Production	Planning Recommendation	Enhance Watershed, Wildlife & Recreation	No Action	Present Demand
Allred North	0	2	2	2	0
Beaver Creek	5	24	35	34	12
Blind Canyon	0	3	7	6	0
Consumers Wash	0	17	17	24	0
Crandall Canyon	0	61	53	61	0
Deadman	0	54	52	55	0
Fish Creek	0	6	1	6	0
Gordon Creek	0	3	3	3	0
Haley Canyon	0	4	3	1	0
Hiawatha	0	4	6	6	0
Iriart	0	14	14	17	0
Keel	0	0	16	1	0
Kimball Canyon	0	1	0	2	0
Kyune I	1	353	386	353	12
Kyune II	7	66	66	45	12
Long Bench	0	22	19	19	0
Marakis	0	3	2	2	0
Mohrland	0	0	8	8	0
Mudwater	0	12	12	12	0
North Hollow	0	12	12	12	0
Price Canyon West	18	60	57	73	48
Spring Canyon	0	118	117	116	0
Stone Cabin	0	0	1	0	0
Sulfur Canyon	113	190	191	54	0
Trail Canyon	0	3	59	76	0
Wattis	0	40	20	40	0
Wildcat	32	223	212	224	0
Willow Creek	5	100	100	100	12
Woodhill	0	1	0	1	0
Total Moose	181	1,396	1,471	1,353	96

5 percent of the total nesting/strutting habitat) are expected to cause significant adverse impacts. Removal of sagebrush in sage grouse nesting habitat can cause cessation of nesting. Klebenow (1970) documented this on treated areas with less than 5 percent live sagebrush canopy cover and observed that nesting was nearly nonexistent in older sprayed areas with around 5 percent live sagebrush cover.

Adverse impacts that would result from implementation of this alternative would result in a decline in sage grouse numbers in the area.

Aquatic Species

Season of Use

Proposed seasons of use in allotments containing high value (supporting a fishery) streams and rivers would adversely impact riparian vegetation on these streams. This would directly impact the fishery supported by the stream. Fall grazing only, rest-rotation grazing, and livestock exclusion are grazing treatments that could be used to mitigate these impacts.

Vegetation Manipulation

No projects are proposed for riparian areas of streams supporting a fishery. On treatments implemented adjacent to riparian areas, a short-term increase in silt load would adversely affect fishery habitat; however, in the long term, the vegetation manipulation would improve the watershed conditions and reduce silt load below present levels. Nevertheless, the long-term result would be a deterioration of aquatic habitat and loss of marginal cold water stream fisheries.

Threatened and Endangered Species

No adverse impacts are expected to any of the six endangered species identified in the EIS area. Proposed vegetative treatments could alter the distribution of the white-tailed prairie dog and thereby affect the possible distribution of black-footed ferret.

Wild Horses

Maximum forage allocation for wild horses would be based on present population levels. In the Green River North Allotment (the single allotment containing a wild horse population), present AM demand for wild horses (300 AMs) would be met.

Proposed season of use and kind of livestock would have little impact on the present horse population. Vegetation manipulation on wild horse range could benefit wild horses by improving forage diversity. Wild horse diets resemble cattle diets, and vegetation projects implemented to improve forage conditions for cattle would also improve conditions for wild horses.

Watershed

Cattle and sheep use in all allotments would result in more types of vegetation being consumed. This would reduce ground cover and litter, retard or reverse vegetative colonization of barren areas, and reduce potential vegetative production in some high use areas. The increased livestock numbers would also increase soil compaction and streambank and channel disturbance. The combination of decreased litter and ground cover, along with increased soil compaction, would reduce soil infiltration rates. This would lead to reduced salt leaching and increased runoff, and this, combined with the bank and channel disturbance, would result in increased erosion, gullying, sedimentation, and increased salinity contribution to the Colorado River. A more detailed discussion of this process is found in the Colorado River Salinity Report (BLM, 1978).

The changes in season of use would also impact watershed values. Changing the grazing season in the Salt Desert Shrub community from spring to winter would reduce erosion, sedimentation, and salinity contributions on those allotments.

The net effect of increased livestock use and altered seasons of use cannot be accurately judged. The increased stock numbers would increase rates of erosion, sedimentation, and salt loading, but elimination of spring grazing on critical areas would reduce these processes. The net result would be an increase in the rates of erosion sedimentation, and salt loading.

Increased livestock numbers would consume approximately 175 acre-feet of water annually. Although there is currently sufficient water available to cover any increase, new water developments may have to be made because of the inequitable distribution of water with respect to available forage. This would be determined in the AMP process. If wells are required, some may be too saline for livestock use (Lines and Plantz, 1981).

Forest Products

The chaining of 68,332 acres of pinyon-juniper woodland would reduce the forest resource by that amount, but this acreage would not be entirely mature stands, since that figure includes maintenance on some already-chained areas. Christmas tree and fuelwood permits may be authorized on these areas, and this would be a beneficial impact for the public. The fuelwood that would become available prior to or following the chaining projects would be approximately 10,250 cords. This projection is based on SVIM data including stems per acre, height, and crown cover of pinyon and juniper trees. These data were then used to calculate cords per acre using a formula derived by Moessner (1962).

Recreation

Continued livestock grazing at present or increased use levels in the Green River corridor and at developed recreation sites in the EIS area would adversely affect the recreational experience for some users. In the Green River corridor, impacts would result from campsite litter, attraction of insects, reduced vegetation and culinary water quality, and deterioration of natural beauty. In a survey of boaters using this area, 7 percent mentioned litter as a negative part of their trip, while 26 percent felt natural beauty was a positive element (Schreyer and Nielson, 1978). Because of constraints on use and increasing demand on this section of the Green River, recreational use of the area would not decline but would continue at about the present permitted level.

A projected decrease in populations of mule deer, antelope, elk, and bighorn sheep, and no change in moose would result in an overall loss of 40,138 hunter days. This estimate is based on a ratio of existing hunter days per fall herd sizes compared to potential hunter days per projected fall herd sizes for species where unrestricted hunting is allowed. On big game species where hunters are restricted by permits offered, the allowable harvest per herd size was used. Hunter days for small game are not expected to change significantly as a result of grazing management.

Wilderness

Lands in the designated WSAs and areas under appeal will be managed according to BLM's IMP and Guidelines for Lands under Wilderness Review. All rangeland management activities will comply with this policy; therefore, no adverse impacts on wilderness values are expected. Continued livestock grazing along the Green River in the Desolation Canyon WSA (UT-060-068A) may detract from the wilderness experience for some boaters on that part of the river. About 82 percent of the 6,000 boaters who float Desolation/Gray Canyons annually felt they were in a wilderness (Schreyer and Nielson, 1978).

Cultural Resources

Significant direct adverse impacts on cultural resources will be avoided or mitigated; therefore, this analysis deals only with inadvertent or indirect impacts. Inadvertent or indirect adverse impacts could result from livestock trampling and rangeland developments, mainly vegetation manipulation projects.

The significance of livestock grazing as a change agent resulting in adverse impacts to cultural resources has not been clearly established. Trampling by livestock can destroy lithic sites and artifacts as shown in a limited study by Roney (1977), but the context of the site is not usually disturbed. Rubbing by livestock can destroy structural sites; however, in this area most such sites are in areas not grazed by or inaccessible to livestock. Of the 253 sites identified in the area, two structural sites and nine lithic sites had suffered some deterioration attributed at least partially to livestock grazing use. Such inadvertent adverse impacts would be expected to continue and perhaps increase with the increased livestock grazing use proposed.

Surface disturbing projects such as the vegetation manipulation projects proposed could inadvertently impact subsurface sites not located in surveys made prior to implementation of the projects. Chaining (and partial seeding) of 68,332 acres of pinyon-juniper vegetation type and plowing and seeding 3,098 acres of sagebrush would be the major change agents that could result in impacts. Burning 1,150 acres of sagebrush could damage surface artifacts not located during surveys, but would not damage subsurface sites. Also only 6 percent of the sites identified occur in sagebrush areas.

The major adverse impacts to subsurface sites (or surface sites not located in surveys made prior to implementing vegetation manipulation projects) would result from chaining pinyon-juniper vegetation types where surveys indicate 69 percent of identified sites were located. Impacts would be damage to artifacts and disturbance of the context of the sites (i.e., rearranging or moving sites).

Information gained from the required intensive surveys and clearances would add to the knowledge of cultural resources in the area, and would be a beneficial impact.

Economics

The area of analysis in this section is mostly confined to Carbon and Emery counties in Utah. This alternative would primarily affect livestock operators, users of wildlife, and recreational boaters along the Green River.

Relevant methodologies, computations, and detailed ranch budget and impact tables are included in Appendix 7.

Impacts on Agriculture: Changes in forage allocation and season of use would affect employment, rancher income, wealth, and ability to borrow, with some spinoff income and employment effects through the local economy. Property tax revenues from all agricultural property account for less than 1.6 percent of total property tax revenues in Carbon and Emery county (UTC, 1982). Total agricultural income is less than 1 percent of all income earned in Carbon and Emery counties (USDC, 1981b). Any change in income or property values would not significantly affect State or county revenues.

The analysis of impacts is based upon the past 5 years' average licensed use (1976-1980), and this tends to overestimate benefits and conceal the negative impacts this alternative would have on some operators. Total impacts under this alternative are therefore divided into two groups: those operators receiving reductions from average licensed use, and those whose forage allocation would be higher than their average licensed use.

Cattle: Of the 73 cattle operators using public rangeland in the EIS area, 45 would receive forage allocations below their current average licensed use. In total, these operators would receive a 42 percent reduction from their average licensed use, resulting in a loss of $118,082 in returns above cash cost, a 35 percent decrease from what these operators now earn.

Twenty-eight of the cattle operators would in total receive a forage allocation level 127 percent higher than their average licensed use. If this forage was grazed, these livestock operators would realize an added $206,379 return above cash cost, a 54 percent increase over what these operators now earn.

The aggregate estimated returns above cash cost for all cattle operators would be $806,087, a 12 percent increase over what these operators now earn. Local employment would increase by one hired labor job (Table 25).

TABLE 25

Aggregate Economic Impact to Livestock Operators, Alternative A

Cattle Operators (all sizes)	Current Situation	Allocation Change	Allocation and Season of Use Change
Total Herd Size	11,053	11,955	11,955
Gross Revenue	$2,584,283	$2,715,272	$2,715,272
Total Cash Cost	1,866,493	1,909,185	2,100,468
Returns above Cash Cost	717,790	806,087	614,804
Returns to Labor and Investment	129,332	204,485	13,202
Sheep Operators (all sizes)			
Total Herd	8,700	34,100	No Change
Gross Revenue	$622,800	$2,451,600	No Change
Total Cash Cost	275,540	834,340	No Change
Returns above Cash Cost	347,260	1,617,260	No Change

Changes in Season of Use: Changes in season of use would vary between allotments. The spring (March-May) exclusions of livestock would be of particular concern to livestock operators, since they have few options with which to respond to these exclusions. Most operators can either purchase feed to replace the lost forage, shift forage that is normally used in other months to this period, or reduce herd size so that forage produced from the base property will last longer.

Under this alternative, 52 of the 73 cattle operators would be excluded at some time during the spring, thereby losing the use of approximately 6,925 AMs (average licensed use during excluded period). The cost of replacing this forage with alfalfa hay purchased at $75 per ton would be $191,692, a 10 percent increase in cash cost (see Table 25). Including these change of season impacts, total returns above cash cost would be $614,804, or 14 percent less than what these operators now earn. Hired labor jobs would not be affected by the changes in season of use.

Replacing lost forage with hay purchases should represent a worst-case analysis. Feeding hay during spring may adversely affect weight gains and reduce gross revenues. If the hay is fed on alfalfa-producing property during the spring, alfalfa yields may be affected, and bloating problems may arise. However, reducing herd size is often the most economical response to changes in season of use (Godfrey, 1981). In addition, 18 of the 52 operators affected by changes in season of use would receive additional forage during the winter, and alfalfa normally consumed during this period could be used during the spring. Therefore, actual impacts are expected to be somewhere between the preference change estimated impacts and the preference and season of use change estimated impacts (Table 25).

Aggregate revenues above cash cost would range between $806,087 and $614,804 (Table 25). Present returns above cash cost are estimated to be $717,790. Whether or not this alternative would have an aggregate positive or negative impact would depend upon how operators adjust to the changes in season of use.

Some operators would have to adjust to other season of use changes, but these changes are not expected to significantly affect their operations.

Sheep: Of the ten sheep operators using public rangeland in the EIS area, three would be allocated forage below their current average licensed use. In total, these operators would receive an 85 percent reduction from their average licensed use, resulting in a loss of $57,201 in return above cash cost, a 55 percent reduction from what these operators now earn.

Seven of the ten sheep operators would in total receive an allocation 880 percent higher than their average licensed use. If this forage was grazed, these operators would realize an added $1,327,201 return above cash cost, a 546 percent increase from what they now earn. However, it is unlikely that all of this forage would be used.

If the added forage was grazed the aggregated estimated returns above cash cost for all sheep operators would be $1,270,000, a 336 percent increase over what they now earn. Local employment would increase by 15 hired labor jobs. This aggregated impact conceals the disproportionate impact between those sheep operators who would gain under this alternative and those who would lose. Although those sheep operators receiving a reduction from their average licensed use would probably be able to earn some return above their cash cost, they would probably not be able to cover their long-term cost and would not be able to earn a return on their labor and investment.

A total of 172,867 AMs of sheep forage would be made available under this alternative. Of this, 59,140 AMs would be allocated to existing sheep operations. Allocation of the remaining 113,727 AMs of forage has not been determined. Some of this forage could be used to offset the adverse impact this alternative would have on three of the sheep operators. Only 50 percent of the current active preference for sheep is being used. There also appears to be a low demand for additional public rangeland forage for sheep. Under these conditions, it is unlikely that much of the unallocated sheep forage would be used. The uncertainty as to how this unallocated sheep forage would be used precludes any economic analysis of the resulting rancher benefits.

Ranch Value and Ability to Borrow: One of the factors determining the base property (ranch) value is the ranch's carrying capacity, which can be affected by changes in the allocation of public forage. Under this alternative, total cattle herd size would increase by 8 percent, and total sheep herd size would increase by 292 percent. This implies an aggregate increase in ranch value, but in the case of cattle operators, the majority (45 of 73) would reduce their herd size, and their ranch value would be reduced.

The value of a Federal grazing permit would normally be incorporated into ranch value through the ranch's total carrying capacity. Grazing permits which do not increase a ranch's carrying capacity may have speculative value. Under these conditions, any decrease from active preference would impact an operator's wealth. Under this alternative, total forage allocations (assuming only 59,140 sheep AMs would be used) would decrease from 98,575 AMs to 86,031 AMs. At a market value of $60 per AUM for BLM grazing permits total operator wealth would decline $120,240. Total property value of the 79 active livestock operators in the PRRA is estimated to be $42 million in 1979 dollars (USDC, 1978). The projected .3 percent value decrease is probably overestimated for there is some uncertainty as to how much of a permit's value, if any, is incorporated in an operators base property value.

Lending institutions base loans on a number of factors, including the rancher's ability to repay the loan. The repayment ability is usually measured by the rancher's likely future income with the loan. Whether or not individual cattle operators' aggregate net revenues increase or decrease under this alternative would depend on how they adjust to the changes in seasons of use. In aggregate, the cattle operators' ability to obtain loans would not be significantly affected by this alternative. However, since the majority of cattle operators would realize reduced net revenues, the impact on borrowing ability would not be evenly distributed.

The change in forage allocation and particularly the change in season of use, would force many ranchers to readjust their operations. These adjustments could be costly and require additional borrowing. Although in aggregate this alternative would not adversely affect the ability of cattle operators to obtain loans, it would increase the need for loans.

Most sheep operators' net income would increase, and this would improve their ability to obtain loans.

Many factors, such as debt burden, level of capitalization, present net income (from ranching operations as well as from other sources), diversification of operation, operator's age, scale of operation, and availability of and proximity to alternative forage sources, influence the ability of a ranching operation to survive income losses. Lack of information on individual operators, as well as the wide range of decision options available to them, makes it impossible to determine whether the reduction-related income losses would force operators out of the livestock business.

Indirect and Induced Impacts: Under this alternative, total herd size of the 73 cattle operations using public forage in the EIS area would increase by 7 percent. The herd size increase would increase the operators' local purchases for their ranches.

Total regional income and employment generated from the livestock operators in the EIS area would increase from $2,008,000 and 161 jobs, respectively, to $2,112,000 and 166 jobs (USFS, 1982). Whether ranchers earn increased income and spend it locally would depend on how they adjust to the changes in season of use. Therefore, operator income changes were not figured into regional totals.

Impacts on Recreation:

Wildlife

The projected decreases in deer, antelope, and elk populations would decrease hunter success rates. The distance hunters must travel and hunter success rates are the primary determinants of hunter pressure on a deer herd (Wennergren, et. al., 1973). Lower success rates would encourage hunters to hunt elsewhere. The reduced hunter pressure would result in $924,000 less income (a 56 percent reduction) and 60 fewer jobs in the region.

Desert and Rocky Mountain bighorn sheep, and moose are not presently hunted in the EIS area, and with the grazing management proposed in this alternative they would probably not achieve a huntable population size. A decrease in small game populations is not expected to significantly affect local expenditures of hunters and regional income.

Decreased success rates and hunter participation would also decrease the value of hunting as an activity. Value is that amount an individual or group is willing to pay, over and above the cost incurred to participate in the activity. Using RPA values for deer and elk and travel cost derived values for antelope, approximately $423,693 of value (a 53 percent decline) would be lost because of decreased hunter participation. Results from a study by Wennergren, et. al. (1973) suggests that value loss would be less if, as expected, hunters accepted a lower success rate and hunter participation did not decrease proportionately with the wildlife population.

Recreation on the Green River

The number of recreational boaters in this area would not change, and local expenditure patterns are not expected to change.

Social Conditions

Some residents of Carbon and Emery counties would be pleased with the equal or increased forage allocation for livestock and the lack of further livestock grazing restrictions in the area. Many livestock operators would be reluctant to add sheep to their operation or change from cattle to sheep, even though a significant increase in sheep forage would be allocated. Other residents would be displeased with the decreased forage availability for wildlife; the continued or increased livestock use in the Green River corridor; and the restrictions on wildlife introductions in the area. Attitudes toward the Federal Government, and more specifically the BLM, would probably not change.

ALTERNATIVE B - PLANNING RECOMMENDATION

Vegetation

The impacts of this alternative would be similar to those described for Alternative A. This analysis presents only those impacts that would be substantially different from those discussed under Alternative A.

Range Condition

Over most of the area, ecological condition would improve as the result of the following actions: changes in kind of livestock, changes in season of use, adjustment of stocking rates, and development of grazing systems. Benefits from dual use would not occur. Continued deterioration could occur in some high use areas, but the 7,032 AMs of forage gained through vegetation manipulation would be used to relieve overutilized areas, and some of these areas might benefit as use is shifted to the treated areas.

Vegetation Types

Riparian Areas: Generally, impacts would be similar to those for the Alternative A. The 15 riparian areas restricted to fall livestock grazing only would benefit if the grazing was in conjunction with a system incorporating Treatments 1 and 2.

Fall grazing alone would reduce the present rate of deterioration. Fall grazing on other areas would benefit most of the existing plants since grazing would not start until most of the year's growth is completed. Cattle as well as sheep use browse in the fall, and utilization exceeding proper use could be expected on most forage species. This would be most detrimental to browse which reproduces on the second year's growth. Reproduction of herbaceous species would not have adequate time for establishment (Davis, 1977).

Aspen: Impacts would be the same as described for Alternative A.

Wet Meadows: Impacts would be the same as those described under Alternative A.

Mountain Browse: Except as noted in the following discussion, impacts would be the same as those described in Alternative A.

Elimination of sheep grazing on the Consumers Wash, Hiawatha, Pinnacle Bench, Porphyry Bench, Crandall Canyon, Trail Canyon, and North Spring Allotments, combined with spring grazing by cattle would essentially eliminate the impact of livestock on mountain browse plants in those areas. Benefits that could be gained from dual use would not occur under this alternative.

Pinyon-Juniper Woodland: Under this alternative, 30,774 acres would be chained and seeded, and the type would be reduced by that amount. Otherwise, impacts would be the same as described under Alternative A.

Salt Desert Shrub: Impacts would be similar to those described under Alternative A except that on Cat Canyon, Church Flat, Clarks Valley, Columbia, Fan Canyon, Farnham, Icelander, Mounds, Mud Springs, and Oil Well Draw Allotments sheep would be eliminated due to a conflict with antelope. Elimination of sheep may result in an increase in the production and density of perennial forbs. Utilization of palatable browse on these allotments would also be decreased by this proposed restriction.

Sagebrush Grass: The types of impacts from the proposed action would be similar to those described under Alternative A. Differences in the magnitude of the impacts are discussed below.

This alternative proposes 6,036 acres of prescribed burning, 1,316 acres of plowing and seeding, and 625 acres of herbicide spraying. The sagebrush type would be reduced by a total of 7,977 acres. Browse production (sagebrush) would be reduced, but grass production would increase on that acreage.

Vegetation Manipulation Areas

Existing vegetation manipulation areas would be maintained, and removal of invading pinyon and juniper trees would reduce competition and favor grass and forb production.

Endangered and Sensitive Plants

No adverse impacts are expected.

Livestock Grazing

Under this alternative, Maintain (M) and Custodial (C) category allotments would be grazed at the current average licensed use level. This would be a decrease from active preference of 2,138 AMs on 33 cattle allotments and 6,147 AMs 35 sheep allotments. Table 26 shows the AM change from active preference for C and M category allotments and changes from active preference and average licensed use for Improve category allotments.

TABLE 26

Change in Forage Allocation and Number of Allotments Affected, Alternative B

Allotment Category	Animal	Active Preference (AMs)	Average Licensed Use (AMs)	Proposed Allocation (AMs)	Number of Allotments Affected			
					Increase		Decrease	
					From Active Preference	From Average Licensed Use	From Active Preference	From Average Licensed Use
M	Cattle	2,969	1,987	1,987	0	0	10	0
	Sheep	4,930	1,121	1,121	0	0	29	0
I	Cattle	37,971	25,339	31,107[a]	25	33	38	30
	Sheep	33,250	4,859	6,138	1	2	16	10
C	Cattle	4,136	2,980	2,980	0	0	23	0
	Sheep	2,775	437	437	0	0	6	0
Area-Wide Totals	Cattle	45,076	30,306	36,074[a]	25	33	71	30
	Sheep	40,955	6,417	7,696	1	2	51	10

[a] Does not include 7,032 AMs gained from proposed vegetation manipulation

Despite a small surplus of sheep AMs from average licensed use, sheep grazing would be eliminated by livestock restrictions on 13 allotments. Included are the allotments that have had high average licensed use for sheep: Consumers Wash, Hiawatha, Pinnacle Bench, Porphyry Bench, and North Spring.

On Improve (I) category allotments, there would be an increase from average licensed use of 5,768 AMs for cattle and a reduction of 6,864 cattle AMs from active preference. After vegetation manipulation projects are implemented, this deficit would be offset by approximately 7,000 AMs as a result of increased production of forage.

The season of use changes on 51 I category allotments would require some changes by livestock operators on those allotments. Livestock grazing restrictions would also require modification of current operations.

Wildlife

Major Grazing Wildlife Species: Forage allocation for major grazing wildlife species, as well as for livestock, was maximized to achieve an optimum combined allocation. Seasons of use and kind of livestock restrictions were proposed on critical wildlife habitats to reduce impacts of livestock grazing. Vegetation manipulation projects proposed in Alternative B are largely reduced and/or modified from Alternative A in an effort to minimize impacts to critical wildlife habitats. Wildlife introductions would be permitted in selected areas where adequate forage was available and where cooperative agreements exist with UDWR.

Mule Deer

Forage Allocation: Total Resource Area AMs available under this alternative (208,127) far exceeds the present AM demand (128,136.5). However, analysis of allotment specific allocation levels in Table 20 shows that available AMs do not meet present demand in 35 of 118 allotments. In comparing Table 20 with Appendix 6, it is clear that the majority of these forage deficiencies occur on winter and critical winter range in herd unit 32-33. In these allotments, available AMs represent only 20 to 60 percent of the present demand. Herd reductions would be necessary in these areas to avoid range overutilization, if this alternative is implemented.

The remaining allotments where available AMs are deficient include summer range allotments in herd units 27B and 32-33, and yearlong range allotments in herd unit 29. Deficiencies in these allotments are generally slight compared to those described for winter and critical winter range. In general, forage requirements on summer ranges in herd units 27B and 32-33 would be met. Forage requirements on yearlong ranges would also be met in all but a limited number of allotments.

Beneficial impacts of forage allocation would include sufficient forage for significant increases in 28 allotments in herd unit 27B. Prior stable forage demand levels would be met or almost met in the majority of these 28 allotments. These allotments represent more than 50 percent of the area of herd unit 27B.

Large increases in mule deer populations are indicated on yearlong ranges (particularly in herd unit 29) based on available forage in this alternative. However, mule deer populations are believed to be at prior stable levels at present. Large increases in deer numbers are not expected on yearlong ranges. Other factors, such as water availability, productivity, and winter survival, also affect population levels.

Season of Use, Kind of Livestock: The proposed seasons of use and kind of livestock and their associated impacts would be the same as described for Alternative A. However, as a means of mitigation, certain restrictions on season of use and kind of livestock have been established for critical wildlife habitats. These restrictions are summarized by allotment in Table 6 in Chapter 1. They include cattle late spring and summer grazing only (May 1 to August 30) and no sheep grazing on 13 allotments containing critical winter range. By implementing this restriction additional AMs would become available for wintering mule deer, over the short term. This would decrease the deficiency of forage on these allotments described earlier. Excessive utilization of high value browse species could be expected to lessen. However, in order to attain proper usage of these species mule deer numbers would need to be reduced. Late spring and summer grazing on winter ranges is believed to improve vigor in high value browse species (Jensen et al, 1972) as well as holding the grass community in balance with browse species.

Aspen communities would be maintained and improved (with grazing treatments) under the proposed seasons of use. These communities are critical in providing a combination of cover (thermal and escape) and high value forb species (especially important in early summer for lactating does).

Vegetation Manipulation: Proposed projects would have limited adverse impacts to mule deer, as well as some beneficial impacts. Adverse impacts would be reduction of canopy cover of pinyon and juniper on critical winter and winter ranges. Although pinyon and juniper stands considered high value for thermal cover (500 or more trees per acre) are not being proposed for treatment, stands of moderate value (200 to 499 trees per acre) are being considered. These pinyon and juniper stands provide important thermal cover required by wintering mule deer. A beneficial impact anticipated from the proposed projects would be increased browse production in pinyon and juniper treatment areas.

Proposed treatment of sagebrush areas on winter ranges would also have both adverse and beneficial impacts. Production of sagebrush (a critically important high value browse species) would be reduced, but forb production (important in mule deer spring diets) would be greatly enhanced. Because proposed sagebrush and pinyon and juniper treatment areas are relatively small, the overall impact would be beneficial for mule deer.

The cumulative impact on herd unit 32-33 would be adverse. Significant herd reductions from present levels would be required to avoid overutilization of browse species. On herd unit 27B, deer populations could increase, but not to prior stable levels on all allotments. On herd unit 29 the deer herd could expand to prior stable levels.

Pronghorn Antelope

Forage Allocation: Forage allocation under this alternative would be beneficial to antelope in the Resource Area. All prior stable forage demands would be met, and in most cases exceeded; however, factors other than available forage (water distribution, forage diversity, forage quality, and habitat suitability) might restrict antelope population levels. For example, where sufficient overall forage is available on an allotment for antelope to increase, but spring and summer forb production is severely impaired by spring sheep and/or cattle grazing, spring forb diversity and production would limit antelope population increases.

On the Icelander herd, the proposed restriction of sheep grazing and spring (March 15 to June 1) cattle grazing on ten allotments that support high priority antelope habitat would benefit antelope population growth.

Season of Use, Kind of Livestock: The proposed season of use on allotments containing high priority antelope yearlong habitat would generally be beneficial to antelope populations. The proposed season (primarily winter) would relieve spring grazing pressure and competition for high value forbs and allow for increased establishment of these species. Some competition between antelope and livestock would result from winter grazing; however, browse species are not believed to be limiting for antelope in the Icelander herd, and proposed transplants would be allowed.

The proposed sheep and cattle grazing would cause some adverse impact because sheep diets closely resemble antelope diets. Despite some adverse impacts, prior stable numbers could be achieved.

Vegetation Manipulation: Proposed projects on antelope range would benefit antelope populations as described under Alternative A.

Elk

Forage Allocation: Forage allocation proposed would have both beneficial and adverse impacts on elk. Allotments containing critical winter range in herd unit 12 would be impacted adversely, since present demand would not be met. A total of six allotments, five containing critical winter range would be impacted. Total AMs available under this alternative would be 27,658 compared to the present AM demand of 5,323. As shown in Table 22 and Appendix 6, adequate forage would be available to support prior stable demand in herd units 22 and RC. Prior stable forage demand would also be met on summer and winter ranges in herd unit 12.

Season of Use, Kind of Livestock: Proposed season and kind of livestock are the same as described for Alternative A. Although adequate forage is available on winter range, impacts affecting browse production would still result from cattle and sheep fall and winter grazing. Season of use and kind of livestock restrictions are proposed to reduce impacts on critical elk winter range. These restrictions would prevent short- and long-term impacts on browse species.

Aspen communities would be maintained and improved if grazing systems are implemented. These communities provide important thermal and escape cover, a crucial source of forbs (which have been shown in local studies to dominate summer diets; Collins, 1977), and are commonly associated with elk calving areas.

Vegetation Manipulation: No projects are proposed for critical winter range. Projects proposed for winter range would have both adverse and beneficial impacts. Impacts would be similar to those discussed for mule deer under this alternative.

Overall, herd unit 12 would require a significant herd reduction from present levels while herd units 22 and RC could increase substantially from present levels. Winter range on herd unit 12 in the EIS area would be adversely impacted without herd reductions, but prior stable levels could be supported in herd unit 22. Herd unit RC could support a stable, huntable population if this alternative were implemented.

Desert and Rocky Mountain Bighorn Sheep

Forage Allocation: The proposed forage allocation would benefit desert and Rocky Mountain bighorn sheep. Present AM demand would be met in all allotments where there are bighorn sheep. Prior stable demand would also be met on most allotments. Overall, bighorn sheep numbers would increase unless other factors are limiting.

Bighorn sheep introductions would be permitted in the Elliot Mountain and San Rafael Reef areas.

Season of Use, Kind of Livestock: Impacts from the proposed season of use and kind of livestock would be the same as proposed in Alternative A; however, to reduce impacts to desert bighorn sheep in the Elliot Mountain herd, a restriction of no sheep grazing would be imposed on three allotments. This restriction would reduce the threat of disease transmission, one of the causes linked to desert bighorn extirpation in the early 1900s.

Vegetation Manipulation: Impacts would be as described under Alternative A.

Moose

Forage Allocation: Moose populations would be impacted favorably by proposed forage allocation levels. As shown in Table 24 and Appendix 6, available AMs would exceed present demand in all allotments and meet or exceed prior stable demand in the majority of allotments.

Season of Use, Kind of Livestock, and Vegetative Treatments: Anticipated impacts would be the same as those discussed under Alternative A.

Sage Grouse and Other Upland Game

Season of Use, Kind of Livestock

Impacts from the proposed seasons of use and kind of livestock would be the same as discussed under Alternative A.

Vegetation Manipulation

No projects are proposed that would have adverse impacts to sage grouse.

Aquatic Species

Season of Use

Proposed seasons of use would be the same as proposed under Alternative A, and therefore negative impacts described in Alternative A would be expected. However, restrictions are proposed to lessen these impacts. Livestock grazing would be limited to fall only in all allotments supporting a perennial stream (see Table 6 Chapter 1).

Vegetation Manipulation

No projects are proposed for riparian areas of streams supporting a fishery. Potential impacts from treatments adjacent to the riparian areas would be as discussed in Alternative A.

Aquatic habitats would generally be benefitted. An improvement in riparian vegetation would improve streambank stabilization and provide increased cover and shading. This would result in improved and expanded fisheries in affected areas.

Threatened and Endangered Species

No significant adverse impacts are anticipated for any of the endangered animal or fish species in the EIS area.

Wild Horses

A total of 489 AMs would be available under this alternative. This would exceed the present demand of 300 AMs. Population increase of 16 horses (from 25 to 41) would be expected over the long term, assuming that no other factor would be limiting.

Impacts from the proposed season of use and kind of livestock would be the same as discussed for Alternative A.

Watershed

The proposed change in kind of livestock would result in some adverse impacts to watershed. The cumulative impacts would be small and localized in nature. Cattle would imprint the soil more deeply, compacting it more, but there would generally be more sheep in a given area, making more hoofprints. Cattle congregate around water more, and would cause more damage to streambanks. Sheep crop the vegetation more closely, reducing ground cover.

Since season of use on I category allotments would be the same as in Alternative A, the impacts on these allotments would be similar. In addition, restricting grazing in important riparian areas to the fall season would eliminate use during the sensitive green out through seed set periods. This would increase the density of riparian vegetation and ground cover, which would reduce erosion, sedimentation, and salinity, as discussed previously. Increased vegetation would also produce a more vigorous root system, which would stabilize streambanks.

Proposed livestock numbers would require approximately 90 acre-feet of water annually. This is about 35 acre-feet less than current demand for active preference level.

Forest Products

The proposed chaining of 30,774 acres of pinyon-juniper woodland would reduce this forest resource by that number of acres. Christmas tree and fuelwood permits might be authorized on these areas. Approximately 4,616 cords of fuelwood would become available on the chained areas.

Recreation

Exclusion of livestock from developed recreational sites and restriction of livestock during the heavy boating use season on the Green River would enhance the recreational experience for users of these areas. Some residual impacts from fall livestock grazing in the Green River corridor would remain. Because of demand and constraints on use, visitor use on these areas is not expected to increase.

The projected overall increase of all big game species in the area would result in an increase of 4,070 hunter days.

Wilderness

Lands in the designated WSAs and areas under appeal will be managed according to BLM's IMP and Guidelines for Lands under Wilderness Review. All rangeland management activities will comply with this policy; therefore, no adverse impacts on wilderness values are expected. Restricting livestock grazing to the period of September 15 to November 15, as proposed on four allotments in the Green River corridor, would eliminate direct conflicts with boaters in the Desolation Canyon WSA during the heavy use period. Some residual impacts such as campsite litter, vegetation use, and lowered culinary water quality from fall livestock grazing may be experienced by recreationists during the next boating season.

Cultural Resources

Impacts that would result to cultural resources in the area would be as described under Alternative A; however, inadvertent impacts would be less because of the lower level of livestock grazing proposed and fewer acres of vegetation manipulation projects proposed. About 30,774 acres of pinyon-juniper type would be chained and seeded, 1,316 acres of sagebrush would be plowed and seeded, and 6,036 acres burned. More of the sagebrush type would be affected, but less than half of the pinyon-juniper type would be chained compared to Alternative A.

Economics

The groups and area that would be impacted by this alternative are the same as described under Alternative A.

Relevant methodologies, computations, and detailed ranch budget and impact tables are included in Appendix 7.

Impacts on Agriculture: Changes in forage allocation and season of use would have impacts on operators similar to those described under Alternative A, except that the degree and number of negatively and beneficially impacted operators would differ.

The analysis of impacts is based upon the past 5 years' average licensed use (1976-1980), and this tends to overestimate benefits and conceal the negative impacts that this alternative would have on some operators. Total impacts under this alternative are therefore segregated into two groups: those operators receiving reductions below their average licensed use and those whose active preference would be higher than their average licensed use.

Of the 73 cattle operators using public rangeland in the EIS area, 45 would receive forage allocations below their current average licensed use. In total, these operators would receive a 58 percent reduction from their average licensed use, resulting in a loss of $139,326 in returns above cash cost, a 35 percent decrease from what these operators now earn.

Twenty-eight of the cattle operators would in total receive allocations 175 percent higher than their average licensed use. If this forage was grazed, these livestock operators would realize an added $209,016 return above cash cost, a 64 percent increase over what these operators now earn.

The aggregated estimated returns above cash cost for all 73 operators would be $787,480, a 10 percent increase over what they now earn. Local employment would increase by one hired labor job (see Table 27).

TABLE 27

Aggregate Economic Impact to Livestock Operators, Alternative B

Cattle Operators (all sizes)	Current Situation	Allocation Change	Allocation and Season of Use Change
Total Herd Size	11,053	11,848	11,848
Gross Revenue	$2,584,283	$2,692,345	$2,692,345
Total Cash Cost	1,866,493	1,904,865	2,031,910
Returns above Cash Cost	717,790	787,480	660,435
Returns to Labor and Investment	129,332	196,819	69,710
Sheep Operators (all sizes)			
Total Herd	8,700	8,310	No Change
Gross Revenue	$622,800	$591,750	No Change
Total Cash Cost	275,540	266,250	No Change
Returns above Cash Cost	347,260	325,500	No Change
Returns to Labor and Investment	281,480	260,060	No Change

Changes in Season of Use: The types of impacts from changes in season of use would be similar to impacts discussed under Alternative A, but the degree of impacts would differ.

Under this alternative, 40 of the 73 cattle operators would be excluded at some time during the spring, thereby losing approximately 4,443 AMs (average licensed use during excluded period). The cost of replacing this forage with alfalfa hay purchased at $75 per ton would be $127,045, a 7 percent increase in cash cost (see Table 27). Including these change of season impacts, total returns above cash cost would be $660,435, 16 percent less than the returns above cash cost without season changes. Hired labor jobs would not be affected by the changes in season of use.

Impacts from replacing forage with hay, and the feeding of stock with hay, would be as described in Alternative A, except that only 9 of the 52 operators would receive additional forage during the winter.

Aggregate revenues above cash cost would range between $787,480 and $660,435 (Table 27). The current aggregate revenue of cattle operators using public rangeland forage is estimated to be $717,790. The aggregate revenue and cost impacts to cattle operators would be similar to those impacts described under Alternative A. About the same number of operators would be either negatively or positively affected, and to a similar degree. The major differences would be which operators are affected.

Some operators would have to adjust to other season of use changes; however, these changes would not significantly affect their operations.

Of the ten sheep operators using public rangeland in the EIS area, six would receive forage allocations below their current average licensed use. In total, these operators would receive a 95 percent reduction from their average licensed use, resulting in a loss of $128,466 in returns above cash cost, a 62 percent reduction from what these operators now earn.

Five of these operators are exclusively sheep operators and would be almost completely excluded from public rangeland forage. Although these operators could still earn some revenue above cash cost, they probably would not be able to cover their long-term cost, and would not earn a return on their labor and investments.

Four of the ten sheep operators would in total receive allocations 285 percent higher than their average licensed use. If this forage was grazed, these operators would realize an added $106,706 return above cash cost, a 77 percent increase from what they now earn. However, it is unlikely that all of this forage would be used.

The aggregated estimated returns above cash cost for all sheep operators would be $325,500, a 6 percent decrease from what they now earn. The number of hired labor jobs would not change.

A total of 7,696 AMs of sheep forage would be made available under this alternative. Of this, 7,490 AMs would be allocated to existing sheep operations. How the remaining 206 AMs of forage would be allocated has not been determined. This forage could be used to offset some adverse impacts the six sheep operators would experience.

Ranch Value and Ability to Borrow: Under this alternative, total cattle herd size would increase by 7 percent, and total sheep herd size would decrease by 4 percent. However, the majority of cattle operators (45 of 73) and sheep operators (6 of 10) would decrease their herd size. Due to the apparent decreased carrying capacity, these operators' base property values would decrease.

As discussed in Alternative A, total operator wealth related to active preference levels could be affected by changes in forage allocations. The reduction in forage allocation would result in a maximum decline in total operator wealth of $939,228, a 2.2 percent loss in total rancher wealth.

The impacts on the ability of cattle operators to obtain loans would be similar to those described under Alternative A. The same number of operators would be negatively affected, but to a slightly greater degree.

Although in aggregate the sheep operators' ability to obtain loans should increase, the majority of these operators (six of ten) would find it more difficult to obtain loans. These operators would also need to make major readjustments in their operation to reduce herd size or obtain other sources of forage. This alternative would affect the ability of these sheep operators to obtain loans and increase their need for loans.

Indirect and Induced Impacts: Under this alternative, total herd size of the 73 cattle operators using public forage in the EIS area would increase by 8 percent. The herd size increase would increase operators' local purchases for their ranches.

Total regional income and employment generated from the livestock operators in the EIS area would increase from $2,008,000 and 161 jobs, respectively, to $2,061,000 and 164 jobs (USFS, 1982). Whether ranchers earn greater income and spend it locally would depend on how they adjust to the changes in season of use. Therefore, operator income changes were not figured into regional totals.

Impacts on Recreation:

Wildlife

Projected increases in deer, antelope, and elk populations would result in an increase in success rate and hunter participation in the area. The increased hunter use would create $93,000 more income (a 5 percent increase) and six more jobs in the region.

Increases in bighorn sheep, moose, and small game would not significantly affect local expenditures or regional income. The total value of hunting in the EIS area would be increased by $44,224, a 6 percent increase (analysis discussed in Alternative A).

Recreation on the Green River

Excluding livestock from the corridor during the period of highest boater use may increase the recreational value of the experience; however, boater use and local expenditure patterns are not expected to change.

With increased recreational value gained, the commercial operators may be able to charge a higher price than would otherwise be possible. This would result in an unquantifiable increase in local income.

Forage foregone by deferring livestock use in the Green River corridor is dependent upon operator reaction, but it would range from none to a value of $720 if no use was made. The current value of boating on this part of the Green River is $759,000. The increased value that would result from exclusion of livestock during the high use periods cannot be quantified.

Social Conditions

Some livestock operators in the area would perceive the proposed forage allocation as a reduction (which it is from active preference) although it represents an actual increase over average licensed use for the past 5 years. This, coupled with changes in season of use, kind of livestock, and restrictions on livestock grazing, would maintain or enhance the attitude that the "government" is making decisions about their lifestyles and operations.

Some residents (local and nonlocal) would be pleased with increased allocations to wildlife, wildlife introductions or reintroductions, and restrictions on livestock grazing to avoid or mitigate conflicts with recreation use and wildlife.

ALTERNATIVE C - ENHANCE WATERSHED, WILDLIFE, & RECREATION

Vegetation

This alternative would provide the least amount of forage on a sustained yield basis to domestic livestock. Large reductions in preference would occur for both cattle and sheep. Ecological condition would improve throughout the EIS area. This is the only alternative that would result in improvement in riparian areas.

Impacts from season of use changes would be as described in Alternative A. The proposed livestock grazing restrictions would cause significant changes in livestock operations on those allotments affected. Impacts would include replacement of forage, herding, fencing, hauling water, and possible reduction of herd sizes.

Range Condition

Ecological condition would improve as a result of season of use changes, reduced stocking rates, and livestock restrictions.

Riparian Areas: In areas where the no livestock grazing restriction applies, ecological condition would improve rapidly (Dahlem, 1979; Davis, 1977). Unprotected areas would stabilize or deteriorate at a slower rate due to season of use changes and reduced livestock stocking rates.

Aspen: Impacts to aspen would be similar to those described under Alternative B. Reduced stocking rates would reduce the impact of livestock on aspen sites.

Wet Meadows: Impacts would be similar to those described under Alternative B. Lower stocking rates would reduce the impact of livestock on these sites.

Mountain Browse: Impacts would be similar to those described for Alternative B.

Pinyon-Juniper Woodland: The pinyon-juniper type would be expected to increase in size. Existing chainings would be reinvaded, and grazing management could not be expected to maintain the chained and seeded areas (Arnold, et al., 1964). Stand expansion in native areas would also occur. Pinyon and juniper trees are favored by fire control and grazing of herbaceous species by livestock. The herbaceous vegetation that is present would decline in area and density.

Salt Desert Shrub: Impacts would be similar to those described under Alternative B.

Sagebrush-Grass: This vegetation type would decrease in size as aspen, riparian vegetation, and wet meadows take over areas that were previously invaded by sagebrush. The beneficial impacts attributed to changes in season of use would be as described under Alternative A.

The proposed reduction in stocking rates would improve the ecological condition on this vegetation type.

Vegetation Manipulation Areas

The useful life of chainings and seedings is generally 20 to 30 years (Tausch and Tueller, 1977). These areas would gradually be reinvaded by either sagebrush or pinyon-juniper.

Endangered and Sensitive Plants

There is no evidence to suggest that endangered and sensitive plant species in the area would be threatened by livestock grazing at the proposed level.

Livestock Grazing

Table 28 shows the change in AMs allocated by allotment category. Areawide, cattle AMs and sheep AMs would be decreased from average licensed use by 10,455 and 768 AMs respectively. Cattle AMs would be decreased 25,225 AMs from active preference, and sheep AMs would be decreased 35,324 AMs from active preference. Four sheep and 40 cattle allotments would be increased from average licensed use. Sheep use would be eliminated on 13 allotments. Included in this number are 10 allotments that have been used by sheep during the 1976 to 1980 period.

TABLE 28

Change in Forage Allocation and Number of Allotments Affected, Alternative C

					Number of Allotments Affected			
					Increase		Decrease	
Allotment Category	Animal	Active Preference (AMs)	Average Licensed Use (AMs)	Proposed Allocation (AMs)	From Active Preference	From Average Licensed Use	From Active Preference	From Average Licensed Use
M	Cattle	2,969	1,987	1,841	5	7	9	7
	Sheep	4,930	1,121	1,865	0	2	2	0
I	Cattle	37,971	25,339	15,213	13	24	48	35
	Sheep	33,250	4,859	1,117	0	0	16	11
C	Cattle	4,136	2,980	2,797	4	9	27	20
	Sheep	2,775	437	2,649	1	2	4	3
Area-Wide Totals	Cattle	45,076	30,306	19,851	22	40	84	62
	Sheep	40,955	6,417	5,631	1	4	22	14

Wildlife

Major Grazing Wildlife Species: Forage availability for major grazing wildlife species would be optimized under this alternative. Seasons of use and kind of livestock restrictions are proposed on high priority and critical wildlife habitats. No vegetation manipulation projects were proposed. Wildlife introductions would be considered wherever suitable habitat and adequate forage was available.

Mule Deer

Forage Allocation: Forage availability for this alternative would be slightly greater than levels under Alternative B. Forage AMs available totaled 215,035, far exceeding the present demand of 128,136 AMs. Nevertheless, available AMs would be insufficient for present demand in 34 of 118 allotments. This deficiency is similar to those described for Alternative B.

Season of Use, Kind of Livestock: Proposed seasons of use and kind of livestock would be the same as proposed in Alternative A. However, as in Alternative B, restrictions would be imposed to mitigate impacts of livestock grazing. Sheep grazing would be eliminated and late spring and summer cattle grazing only would be allowed on the majority (42) of allotments containing critical winter and/or winter range. These restrictions would mitigate impacts of overutilization and improve vigor on high value browse species. An increase in available forage should also result from implementation of these restrictions.

Vegetation Manipulation: No projects are proposed, and pinyon-juniper woodland habitats are expected to reinvade existing chainings on winter and critical winter ranges. In the short term, as cover improves, mule deer populations would benefit from improved distribution and utilization patterns on these chainings. However, as stands mature, production of understory vegetation would decrease, resulting in a long-term reduction of forage AMs.

The overall impact would be a significant population increase in herd unit 27B; however, prior stable numbers would not be met. On herd unit 32-33, reductions from the present level would be necessary to avoid damage to winter ranges.

Pronghorn Antelope

Forage Allocation: As shown in Table 21 and Appendix 6, adequate forage is available for present and prior stable demand. Allocation for antelope would be slightly greater than in the Alternative B. However, the impacts of AMs in excess of prior stable demand would be as discussed in Alternative B.

Wildlife introductions could be accomplished in the Icelander and Green River herd units. Animal months are available for prior stable numbers to be attained; however, other limiting factors such as water distribution and forbs availability may limit populations from reaching prior stable levels.

Season of Use, Kind of Livestock: The proposed season of use and kind of livestock are the same (with the exception of restrictions) as proposed in Alternative A. Restrictions, although similar to Alternative B, are more restrictive and would be applied to a larger area. The proposal for the majority (26) of allotments containing high priority antelope range would restrict cattle grazing to summer, fall, and winter. The impact of this restriction is discussed under Alternative B.

The overall impact to antelope would be beneficial. Prior stable numbers could be achieved and competition with livestock would be largely eliminated allowing population growth and expansion.

Elk

Forage Allocation: This alternative would provide for the greatest allocation of forage to elk, although AMs are only slightly increased from levels in Alternative B. Available AMs would still be inadequate for present demand on the five allotments containing critical winter range. Adequate forage would be available to meet or almost meet prior stable demand for all other elk habitat.

Implementation of this alternative would allow introductions of elk into the Range Creek elk herd to help reach prior stable levels.

Season of Use, Kind of Livestock: Proposed season and kind are the same (with the exception of restrictions) as proposed for Alternative A. Restrictions proposed in this alternative are the same as described under Alternative B, and would affect the same allotments.

Aspen communities would respond essentially the same as described under Alternative B. Grazing systems would be required for maintenance or improvement, and this would improve the suitability of elk summer and fall ranges.

Without grazing systems, aspen would slowly degrade, reducing the suitability of elk summer ranges over the long term.

Cumulative impacts to elk would include large population increases (from present levels) in herd unit RC and 22 and slight herd reductions for herd unit 12. Prior stable population levels could be supported in herd unit 22. Winter ranges in herd unit 12 would be adversely impacted without reductions. Impacts discussed for herd units 12 and 22 would not be fully expressed in the herd populations as the majority of the unit is outside the EIS area. Supplemental plants of elk into the RC herd unit would be possible, and this would accelerate the achievement of prior stable population levels.

Desert and Rocky Mountain Bighorn Sheep

Forage Allocation: This alternative would provide the most bighorn sheep AMs. Although forage availability would be increased, prior stable demand would not be met in 5 of the 11 allotments containing bighorn sheep range. The forage on the remainder of the allotments would meet present demand and would almost meet prior stable demand. Prior stable population levels could be sustained.

Wildlife introductions would be permitted under this alternative. Introductions considered would be those already described in Alternative B and supplemental plants of Rocky Mountain bighorn into the Green River herd.

Seasons of Use, Kind of Livestock: Season of use and kind of livestock would be the same as proposed for Alternative A except proposed restrictions would exclude livestock grazing on allotments entirely or predominantly encompassed by desert bighorn sheep range. These allotments are listed in Table 8 in Chapter 1. The restriction would mitigate adverse impacts of livestock grazing, and is supported widely in the literature. Another proposed restriction would eliminate sheep grazing on all Rocky Mountain bighorn sheep ranges. This restriction would reduce competition for forage between domestic and Rocky Mountain bighorn sheep, and it would also reduce disease transmission.

Moose

Forage Allocation: Forage availability under this alternative would be highly favorable to moose populations in the Resource Area. Forage levels would exceed those under all other alternatives and would meet prior stable demand in all but two allotments containing moose habitat. Forage availability would not limit expansion of this herd.

Season of Use, Kind of Livestock: Anticipated impacts would be the same as those discussed under Alternative A.

Sage Grouse

Season of Use, Kind of Livestock

Restriction of livestock grazing is proposed on allotments containing nesting and strutting ground habitat. The restriction, no livestock grazing in sage grouse nesting areas from April 1 to July 1, is intended to reduce impacts of nest trampling and competition for forb species (crucial to young sage grouse), and to allow for increased establishment of forb species in the vegetative community.

Wet meadows would be maintained or their deterioration reduced considerably. With reduced livestock use, improvements in these important habitat types would be expected. Sage grouse habitat, particularly brood rearing habitats, are heavily dependent on these areas for high value forbs. Sage grouse populations would respond with increased production and numbers.

Aquatic Species

Season of Use: Restrictions are proposed in allotments supporting perennial streams or rivers. This restriction, no livestock grazing, is intended to allow riparian areas to improve. This would have a direct beneficial impact to existing fisheries and could also result in improving unsuitable streams to streams suitable for fisheries production. Range Creek is a good example of a stream not supporting a valued fishery (on a 5-mile stretch above the mouth) largely due to water temperature. Exclusion of livestock grazing from this riparian area would increase overstory vegetation (partly through cottonwood reproduction) and through shading, lower the water temperature to a point suitable for a cold water fishery.

Threatened and Endangered Species

No significant adverse impacts are expected to occur to any of the endangered animal or aquatic species identified in the EIS area.

Wild Horses

A total of 839 AMs would be available under this alternative. This far exceeds the present demand of 300 AMs. An increase of 45 (from 25 to 70) wild horses in Green River North Allotment could be expected over the long term, assuming no other factor would be limiting. Introductions of wild horses would be permitted to reach long-term goals. Impacts from proposed season of use and kind of livestock would be as discussed under Alternative A.

Watershed

This alternative would restrict livestock access to riparian areas, reducing erosion, sedimentation, and salinity. This alternative would provide the most protection to the watershed resource of any considered.

Beneficial impacts from reduced livestock grazing levels would be similar to those described under Alternative B.

The gains in watershed conditions would be most notable in the Green River corridor. The Lost Springs Wash drainage has severe gully erosion along with piping, especially in the younger, smaller gullies. Removing livestock from this area would give it the protection necessary to reduce the accelerated gully formation. Further treatment would be necessary to make the area productive and suitable for return to grazing.

Season of use changes would be the same as in Alternative A, and beneficial impacts of this action would be as described under that alternative. The annual livestock demand for water would be 50 acre-feet, less than one-half the current demand for active preference level.

Recreation

Exclusion of livestock grazing from the Green River corridor and developed recreation sites would enhance the recreational experience for users of these areas.

The projected increase of all big game species in the area would result in an increase of 9,402 hunter days.

Wilderness

Lands in the designated WSAs and areas under appeal will be managed according to BLM's IMP and Guidelines for Lands under Wilderness Review. All rangeland management activities will comply with this policy; therefore, no adverse impacts on wilderness values are expected. Elimination of livestock grazing, as proposed on parts of four allotments in the Green River corridor, would eliminate any direct conflicts or residual impacts resulting from livestock grazing in that part of the Desolation Canyon WSA. This would enhance the wilderness experience for some boaters on that part of the river. About 82 percent of boaters on the Desolation/Gray Canyons run felt they were in a wilderness and natural beauty was the second most popular attraction (rapids were first) mentioned by users (Schreyer and Nielson, 1978).

Cultural Resources

Inadvertent impacts from livestock trampling and rubbing would be as described in Alternative A, but would be lower in magnitude because of the reduced level of livestock grazing proposed.

Economics

The groups that would be impacted by this alternative and the area impacted would be the same as described under Alternative A.

Relevant methodologies, computations, and detailed ranch budget and impact tables are included in Appendix 7.

Impacts on Agriculture: Changes in forage allocation and season of use would have impacts on operators similar to those described under Alternative A, except that the degree and number of negatively and beneficially impacted operators would differ.

The analysis of impacts is based upon the past 5 years' average licensed use (1976-1980), and this tends to overestimate benefits and conceal the degree of negative impact this alternative would have on many operators. Total impacts, therefore, are divided into two groups: those operators receiving forage allocations below their average licensed use, and those whose allocation would be higher than their average licensed use.

Cattle: Of the 73 cattle operators using public rangeland in the EIS area, 51 would receive forage allocations below their current average licensed use. In total, these operators would receive a 56 percent reduction from their average licensed use, resulting in a loss of $282,386 in returns above cash cost, a 50 percent reduction from what these operators now earn.

Twenty-two of the cattle operators would in total receive an allocation of forage 43 percent higher than their average licensed use. If this forage was grazed, these livestock operators would realize an added $27,478 return above cash cost, a 17 percent increase over what they now earn.

The aggregated estimated returns above cash cost for all cattle operators would be $462,887, 36 percent less than they now earn. Local employment would be reduced by seven hired labor jobs (see Table 29).

TABLE 29

Aggregate Economic Impact to Livestock Operators, Alternative C

Cattle Operators (all sizes)	Current Situation	Allocation Change	Allocation and Season of Use Change
Total Herd Size	11,053	9,484	9,484
Gross Revenue	$2,584,283	$2,161,850	$2,161,850
Total Cash Cost	1,866,493	1,698,963	1,848,525
Returns above Cash Cost	717,790	462,887	313,325
Returns to Labor and Investment	129,332	-104,392	-253,954
Sheep Operators (all sizes)			
Total Herd	8,700	6,333	No Change
Gross Revenue	$622,800	$499,850	No Change
Total Cash Cost	275,540	222,960	No Change
Returns above Cash Cost	347,260	226,890	No Change
Returns to Labor and Investment	281,480	163,020	No Change

The impacts from season of use changes would be as described under Alternative A, but would vary in degree. Options the operators would have to adjust to season of use changes would be the same.

Under this alternative, 52 of the 73 cattle operators would be excluded at some time during the spring, thereby losing the use of approximately 6,744 AMs (average licensed use during the excluded period). The cost of replacing this forage with alfalfa hay purchased at $75 per ton would be $149,562, or a 9 percent increase in cash cost (see Table 29). Including these change of season impacts, total returns above cash cost would be $149,562. This is 32 percent less than returns above cash cost without season changes.

Impacts from replacing forage with hay, and the feeding of stock with hay, would be as described in Alternative A, except that only 14 of the 52 operators would receive additional forage during the winter.

Sheep: Of the ten sheep operators using public rangeland in the EIS area, eight would receive forage allocations below their current average licensed use. In total, these operators would receive an 89 percent reduction from their average licensed use, resulting in a loss of $160,040 in return above cash cost, a 58 percent reduction from what they now earn.

Two of the ten sheep operators would in total receive forage allocations 271 percent higher than their average licensed use. If this forage was grazed, these operators would realize an added $39,670 return above cash cost, a 57 percent increase above what they now earn.

The aggregated estimated returns above cash cost for all sheep operators would be $226,890 (-35 percent), and would decrease local employment by one hired labor job. This aggregated impact conceals the true significance of this alternative to most of the sheep operators. Six of the ten operators would be entirely excluded from public rangeland forage. One of the other two negatively impacted operators is in the sheep ranching business exclusively and would receive a 96 percent preference reduction from active use. Although many of these ranchers could still earn some revenue above cash cost, most would neither be able to earn a return on their labor and investment nor be able to cover their long-term costs.

A total of 5,631 AMs of sheep forage would be made available under this alternative. Of this, 3,824 AMs would be allocated to existing sheep operations. How the remaining 1,807 AMs of forage would be allocated has not been determined. The unallocated sheep forage could be used to affect some of the negative impacts on sheep operators. If so, the resulting impacts would be less than projected.

Ranch Value and Ability to Borrow: Total cattle herd size would decrease by 14 percent, and total sheep herd size would decrease by 27 percent thereby reducing rancher wealth. Forage allocation would decrease 39 percent and this would reduce rancher wealth by a maximum of $1,937,400, a 4.6 percent decrease in total rancher wealth.

The cattle operators' net revenue above cash cost would decrease by 32 percent, and this would decrease their ability to obtain loans. The proposed change in active preference levels, and particularly the proposed change in seasons of use, would not only decrease the chance of obtaining loans, but it would also increase the need for loans. By reducing the operator's collateral (base property value), this alternative would also reduce the size of obtainable loans.

The aggregate sheep operator net revenue reduction of 35 percent would have similar effects, but to a greater degree.

Indirect and Induced Impacts: Under this alternative, total herd size of the 73 cattle operators using public forage in the EIS area would decrease by 14 percent, and total sheep herd size of the ten active sheep operators would decrease by 27 percent. The herd size changes and resulting income changes would reduce the operators' local purchases for their ranches, and also reduce their local expenditure of income.

Total regional income and employment generated from the livestock operators in the EIS area would decrease from $2,008,000 and 161 jobs, respectively, to $1,357,265 and 143 jobs (USFS, 1982). The actual loss of jobs could be greater, depending upon the number of livestock operators who leave the business.

Impacts on Recreation:

Wildlife

The projected increase of big game populations would result in increased success rates and hunter participation in the area. This increased use and expenditures would increase local income by $215,000 (13 percent) and local employment would increase by 16 hired labor jobs.

The value of hunting, as discussed in Alternative A, would increase by $103,498 (a 13 percent increase) as a result of increased hunter participation.

Recreation on the Green River

Excluding livestock completely from the Green River corridor may increase the resource value of the area, but use and expenditure patterns would not change because of the permit system. The existing permit system restricts commercial use of the Green River. Without restrictions, competition would normally drive boating prices down to cost. As commercial use of the river becomes restricted, outfitters can capture resource values in their prices. If excluding livestock from the Green River corridor increases the areas recreational values, river operators would be able to charge a higher price than would otherwise be possible.

The net annual value of boating on the Green River is estimated to be $759,000. The forage foregone by excluding livestock completely from the Green River corridor has an estimated annual value of $720. Increased recreation values cannot be compared with the forage value foregone because the increased recreation value cannot be quantified.

Social Conditions

Public reaction to this alternative would be similar to that described for Alternative B. Most livestock operators in the area would react negatively to the proposed cuts in livestock forage allocation, changes in season of use, and livestock grazing restrictions. This alternative represents the most significant changes in current livestock operations in the area, and would cause resentment in most operators. Recreation users, however, would favor this proposed management.

ALTERNATIVE D - NO ACTION

Vegetation

Of the four alternatives, Alternative D would have the greatest long-term adverse impact on vegetation. High value range sites such as aspen, wet meadows and riparian areas would decline in ecological condition and acreage. Vigor and composition of key livestock forage species would be reduced. The beneficial impacts that could arise from implementation of season of use changes, grazing systems, livestock reductions, and restrictions would not occur. Cattle forage would be overobligated. In the long term, productivity of forage for cattle would be reduced. A surplus of sheep forage would exist.

Range Condition

If the average licensed use were continued, condition would not change significantly in the short term. If full preference were activated, utilization of forage would exceed proper use levels by 36 percent. This degree of utilization could be expected to have noticeable adverse impacts within 5 years. Under either the past average licensed use or full active preference use, short-term and long-term deterioration of high value, heavily utilized sites would be expected.

The change agents that would affect range condition include continued overuse of forage, poor livestock distribution, improper season of use, and continued unauthorized use. The impacts that would result from these change agents are discussed in more detail under individual vegetation types.

Vegetation Types

Riparian Areas: The existing degradation of riparian sites described in Chapter 2 would continue. Adverse impacts described under the previous alternatives would also occur. This would result in a decline of ecological condition on 80 percent of the riparian acreage in the area. In the long term, riparian acreage would decrease.

Aspen: Climax aspen stands that are in degraded condition would continue to decline in condition and size in the short term. They would be lost entirely in the long term. Schenbeck and Dahlem (1977) reported that aspen stands reach maturity in 80 to 100 years and then undergo natural deterioration if reproduction does not occur. Reproduction is threatened by indiscriminant browsing of the reproductive root suckers. Only aspen stands that are inaccessible to livestock would survive. There are about 1,200 acres of this type of stand. Aspen is a high value site and is climax on only about 3,200 acres; consequently, any loss of aspen groves would be a significant adverse impact.

Wet Meadows: The deterioration of wet meadows described in Chapter 2 and adverse impacts described under other alternatives would continue to occur. The result would be a short-term decline in condition and a long-term loss of acreage occupied by this vegetation type.

Mountain Browse: Mountain browse sites, particularly those on the benches west and southwest of Price, would continue in a downward trend. Key browse species would remain in mature and overmature age classes and continue to show heavy utilization. Reproduction of these species would be virtually nonexistent over a large part of their range. Composition consisting of mostly grasses and less palatable browse would be expected on those allotments with fall and winter sheep grazing. On allotments where cattle are grazed in late spring and summer, significant impacts to this type are not anticipated.

Pinyon-Juniper Woodland: Under the No Action Alternative, the pinyon-juniper woodland would increase in size. This would be due to reinvasion of existing chainings and stand expansion as competition for water and nutrients from herbaceous species is removed by livestock grazing. Palatable understory vegetation would be further lost as tree density increased. Because of the efficiency and competitive nature of these trees, most of the understory production is lost when tree density exceeds 700 trees per acre (West, 1981).

Salt Desert Shrub: Allotments grazed in the spring and encompassing salt desert shrub ranges would continue to deteriorate. Cook (1977) reported that spring use of key forage species (Indian ricegrass, winterfat, Nuttal saltbush, and shadscale) in excess of 25 percent results in a loss of vigor and eventual death of the plant. Winter utilization of 50 percent or less would maintain optimum vigor and sustained yield. Forb production on spring-grazed allotments would be depressed, and less palatable shrubs and warm season grasses would increase. Ecological condition would decline on this type in allotments where spring grazing is practiced. On allotments grazed in the winter where proper use (Appendix 3) is exceeded, a long-term decline in ecological condition is anticipated. These allotments are: Box Flat, Calf Canyon, Cleveland Winter, Elmo, Oviatt, Smith, Humbug, Summerville, and South Olson Lake.

Sagebrush-Grass: This vegetation type would be expected to increase in size as a result of invasion into wet meadow, riparian, climax aspen sites, and seedings. Herbaceous cover would increase in this type on allotments grazed by sheep in fall and winter. On cattle allotments grazed in spring and early summer, herbaceous cover would decrease.

Vegetation Manipulation Areas

The useful life of seedings and chainings is generally 20 to 30 years (Tausch and Tueller, 1977). These areas would gradually be reinvaded by either sagebrush or pinyon-juniper.

Endangered and Sensitive Plants

There is no evidence to suggest that endangered and sensitive plant species in the area are threatened by livestock grazing at existing levels.

Livestock Grazing

Table 30 shows the number of allotments that would be under- or over-obligated from active preference and average licensed use levels. The AM figures in the table represent the difference between active preference or average licensed use and present livestock forage capacity based on the existing kind of stock and season of use. Appendix 4 gives the existing AMs available on individual allotments.

On 42 I category allotments, active preference would exceed forage available by 21,695 cow AMs. Average licensed cattle use exceeds available forage by 12,835 AMs on 32 I category allotments. The entire area would have a net cattle overobligation of 21,413 AMs from active preference and 6,643 AMs from average licensed use.

A surplus of sheep forage would be available. The surplus would be 49,012 AMs above average licensed use and 14,474 AMs above active preference. This surplus would not be as dramatic as the large numbers indicate. Of 27 allotments with sheep preference, 24 have been in substantial nonuse (average

TABLE 30

Current Use, Forage Available, and
Status of Forage Obligation, Alternative D

Allotment Category	Animal	Active Preference (AMs)	Average Licensed Use (AMs)	Forage AMs Currently Available[1]	Number of Allotments Affected			
					Allotments Underobligated		Allotments Overobligated	
					From Active Preference	From Average Licensed Use	From Active Preference	From Average Licensed Use
M	Cattle	2,969	1,987	2,519	7	8	7	6
	Sheep	4,930	1,121	1,182	0	2	4	2
I	Cattle	37,971	25,339	18,361	12	22	42	32
	Sheep	33,250	4,859	44,650	7	15	12	3
C	Cattle	4,136	2,980	2,783	8	12	24	19
	Sheep	2,775	437	9,597	4	7	7	3
Area-Wide Totals	Cattle	45,076	30,306	23,663	27	42	73	57
	Sheep	40,955	6,417	55,429	11	24	23	8

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[1] Assumes current season of use and kind of livestock

licensed use less than 30 percent of preference) for several years. These include some of the largest sheep allotments: Last Chance, River, Woodside, Elliot Mountain, Green River South and Trail Spring.

A long-term decline in cattle forage would be expected, due to loss of palatable vegetation and increases in undesirable plants. This impact is discussed further under each vegetation type.

Wildlife

Major Grazing Wildlife Species: Forage availability for major grazing wildlife species would be based on optimum combined use of existing vegetation production with existing seasons of use and kind of livestock. No restrictions on kind of livestock and season of use are proposed, and no vegetative treatments are proposed. Wildlife introductions would be permitted as scheduled if adequate forage is available.

Mule Deer

Forage Allocation: Forage availability for mule deer would be substantially greater than Alternative A and slightly less than Alternatives B and C. Available AMs for the EIS area total 161,487 AMs; this exceeds the present demand of 128,136 AMs. Allotment-specific allocation levels shown in Table 20, indicate that AMs would be insufficient for present demand in 42 of 118 allotments. The impacts of these deficiencies, although involving more allotments, would be similar to those described under Alternative B.

Season of Use, Kind of Livestock: Existing seasons of livestock use would cause adverse impacts to a number of allotments in herd unit 32-33. Porphyry Bench, Fausett, Pinnacle Bench, North Spring, and Haley Canyon Allotments contain the majority of acreage of ~~critical~~ crucial winter range in herd unit 32-33. The existing season of use for these allotments is fall and winter grazing. This season of use would cause direct competition for browse with mule deer and over the long term could result in the loss of these species from the vegetative community. Fall grazing would continue on a number of other allotments on winter range and cause similar, although less severe, impacts.

Kind of livestock would also cause adverse impacts to critical winter ranges in herd unit 32-33. Sheep use would continue on Consumers Wash, Pinnacle Bench, Porphyry Bench, North Spring, Fausett, and Hiawatha. Sheep diets contain larger percentages of browse species than do cattle diets, and this would result in greater competition for these species. The cumulative effects of sheep fall and winter grazing in Porphyry Bench, Pinnacle Bench, North Spring, and Fausett allotments would be detrimental to critical range and over the long term could result in an overall reduction of carrying capacity on herd unit 32-33.

Aspen communities crucial to mule deer summer ranges would continue to deteriorate and in the long term be lost in many areas.

Overall population levels on herd unit 27B would be maintained or increased slightly. On herd unit 32-33, substantial reduction of herd size would be necessary to avoid overutilization of browse on winter ranges.

Pronghorn Antelope

Forage Allocation: Present AM demand would be met in 31 of 34 allotments containing antelope range. Prior stable demand would be met in 29 allotments. On three allotments, present demand would not be met. On the 29 allotments where prior stable demand would be met, supplemental plants of antelope would be permitted, thereby allowing the Icelander herd to grow toward prior stable levels.

Season of Use, Kind of Livestock: The existing seasons of use (listed in Table 3 in Chapter 1) would adversely impact antelope habitats. Spring use would cause direct competition for high value forbs species ~~critical~~ crucial to antelope spring and summer diets. Long-term effects of these impacts would be further reduction of the forb component in native antelope ranges (in allotments grazed in the spring), and reduction of the capability of the area to support antelope.

The current use is made principally by cattle on most allotments with antelope range. Cattle grazing is preferred over sheep grazing and would be considered beneficial. However, sheep grazing is proposed in eight allotments, and this use would be an impact. Season of use and kind of livestock would adversely impact antelope populations. Prior stable population levels would not be met.

Elk

Forage Allocation: Present demand would be met in 43 of 52 allotments containing elk habitat. All five critical winter range allotments would be adversely impacted. The type of impact would be similar to that discussed under Alternatives B and C, but there would be a greater forage deficiency on these allotments under Alternative D. Two allotments, one summer range and one winter range would not have adequate available AMs for present demand. Two more allotments, not deficient under proposed allocations in Alternatives B and C, can be added to the others, totaling nine allotments that would be adversely impacted by existing livestock use.

Season of Use, Kind of Livestock: Fall grazing on three of the five allotments containing critical winter range would adversely impact wintering elk through competition for forage. Sheep grazing on the same three allotments would compound these impacts. Impacts on elk would be similar to those discussed for winter ranges in mule deer herd unit 32-33 regarding season of use and kind of livestock. Overall, population levels would increase on herd unit RC and 22, but the population on herd unit 12 would decrease from present levels.

Desert and Rocky Mountain Bighorn Sheep

Forage Allocation: Forage availability under this alternative would favorably impact desert and Rocky Mountain bighorn sheep. Present demand would be met in all allotments with bighorn sheep habitat, and prior stable demand would be met in 5 of 11 bighorn sheep allotments. Introductions of bighorn sheep would be permitted in the Elliot Mountain and San Rafael herds.

Season of Use, Kind of Livestock: Existing seasons of use and kind of livestock would adversely impact desert bighorn sheep. The impacts are competition for space (desert bighorn would be displaced by livestock), competition for forage, and possible disease transmission from livestock. The most severe impacts are expected on the Elliot Mountain, Woodside, and Last Chance Allotments. Although adequate forage would be available, livestock competition may make the introduction of additional bighorn sheep less feasible.

Moose

Forage Allocation: Present AM demand would be met in all allotments with moose habitat. Prior stable demand would be met in 26 of 29 allotments. Overall, implementation of this alternative would benefit moose populations in the EIS area.

Season of Use, Kind of Livestock: All allotments containing critical moose yearlong range (except Gordon Creek) have fall and/or winter grazing. This season of use would adversely impact moose populations by increased forage competition; however, few acres of critical yearlong range fall on public lands, and impacts to the Manti moose herd would be minor.

Sage Grouse and Other Upland Game

Season of Use, Kind of Livestock: Existing seasons of use on allotments supporting sage grouse nesting, strutting, and brood rearing habitats would adversely impact sage grouse populations. The season begins on May 15 (June 1 in two allotments) and runs through the fall. The early portion of that season (May 15 to July 1) would cause competition for forb species on which young sage grouse depend. Long-term impacts of grazing during this period would be reduction of the forb component in the vegetation competition and reduced suitability for sage grouse.

Wet meadows, a crucial component of brood rearing habitat, are expected to be lost through increased headcutting, lowering of the water table, and invasion of brush species. Loss of these habitats on public lands, where similar deteriorating conditions occur on adjacent private and State lands, could significantly reduce sage grouse populations in the EIS area.

Other upland game birds, particularly ruffed and blue grouse, would also be adversely impacted from the above actions. However, brood rearing habitats have not been identified for these species.

Aquatic Species

Season of Use: Riparian habitats are expected to continue deteriorating under this alternative. As riparian habitat conditions degrade, stream channel stability would decline, and streams supporting fisheries would become less suitable for fishery production. Riparian areas associated with headwaters (generally inaccessible to livestock) are in better condition than lower, more accessible reaches. The majority of these areas (55 percent of which were rated as in good condition) would probably not change. Middle and lower stretches, which are in predominantly poor condition, would degrade even further.

Threatened and Endangered Species: Exisiting livestock grazing practices are not expected to adversely impact any of the endangered animal species identified in the EIS area.

Wild Horses: Available AMs for wild horses under this alternative total 347, slightly above the present demand of 300. A population increase of four horses (from 25 to 29) could occur. Yearlong grazing by cattle on wild horse range would cause decreased vigor of desirable species and increases in undesirable forage species; this would be an adverse impact to forage conditions for wild horses.

Watershed

Because there would be no management changes proposed in this alternative, no changes in impacts to watershed are expected to occur. The situation would remain essentially as described in Chapter 2. Erosion and salinity contribution to the Colorado River would continue at present rates or accelerate as ecological condition on some allotments continues in a downward trend. If operators are licensed to preference levels, the increased livestock use would be at least partially responsible for the accelerated adverse impacts. The annual water demand for livestock grazing at active preference level would remain at 125 acre-feet.

Recreation

Impacts on recreation users of the Green River corridor and developed recreation sites would be as described in Alternative A.

The projected long-term increase of all big game species except deer in the area would result in an increase of 3,866 hunter days. In the long term, deteriorating range conditions would offset the increase and a decline in animal numbers, with a subsequent decline in hunter days, would be expected.

Wilderness

Lands in the designated WSAs and areas under appeal are being managed according to BLM's IMP and Guidelines for Lands under Wilderness Review; therefore, no impacts on wilderness values are expected. Existing conflicts between livestock and boaters on the Green River in the Desolation Canyon WSA would continue. These conflicts include competition for space and vegetation, campsite litter, and deterioration of culinary water quality.

Cultural Resources

Inadvertent impacts to cultural resources would continue as described in Chapter 2 if average licensed livestock use continued. Impacts would be similar to those under Alternative C. If operators increased livestock grazing use by licensing to authorized active preference levels, adverse impacts from livestock trampling and rubbing would increase. Impacts would be less than under Alternative A, but more than under Alternatives B and C.

Economics

The groups that would be impacted and the impact area would be the same as described under Alternative A.

Impacts to Agriculture: Economic conditions for livestock operators in the short term are not expected to change from the current situation described in Chapter 2. Average licensed use by cattle under the existing season of use exceeds present grazing capacity for cattle by 22 percent. In the long term, most operators would have to reduce forage consumption by cattle or experience reduced cattle weight gains and possible losses of stock. Consequently, long-term rancher incomes would be expected to decline.

Average licensed use by sheep is far lower than present sheep grazing capacity. Restricting use at the 5-year average licensed use level would prevent sheep operators from increasing their herd size and realizing increased income.

Economic conditions for livestock operators would be similar if actual use was increased to active preference levels. Short-term income increases could be realized if ranchers increased their herd sizes; however, the sustained yield constraints would prevent the ranchers from realizing any long-term gains from such an action. Sheep operators would be able to increase their herd size and gain increased income at their active preference level. The resulting impacts would be similar to those described in Alternative A, except that no operators would be negatively impacted.

Impacts on Recreation:

Wildlife

The projected long-term increase in all big game species except deer would increase success rates and hunter participation in the area. This would result in an increase in local income of $80,000 (5 percent) and six jobs.

The value of hunting (as discussed in Alternative A) would increase by $45,367 (a 6 percent increase) as a result of the increased hunter participation.

Recreation on the Green River

Recreation use would continue as at present, and no changes in local expenditures, income, or jobs are expected.

Social Conditions

Livestock operators would be pleased with maintaining the status quo although some may desire changes in their use of public lands. Recreation users would be disappointed that nothing was done for wildlife or that conflicts between recreation users and livestock were not resolved. The general attitude of residents would not change, but would continue as described in Chapter 2.

NATURAL OR DEPLETABLE RESOURCE REQUIREMENTS AND CONSERVATION POTENTIAL OF THE ALTERNATIVES

An unquantified amount of gasoline and diesel fuel would be expended on proposed vegetation manipulation projects and regularly scheduled management activities and monitoring. The most significant amount would be used on chaining and seeding of pinyon-juniper areas. Fuel consumption would be greatest in Alternative A where 68,332 acres would be treated. Alternative B proposes to treat 30,774 acres, so fuel consumption would be less than half. The greatest potential for conservation of fuel would be in Alternatives C and D where no vegetation manipulation is proposed.

Burning or spraying of sagebrush areas would be slightly more fuel efficient than plowing and seeding. Use of the selective management category system would result in fuel savings in all alternatives because of less intensive management and monitoring on M and C category allotments.

Approximately 68,332 acres or 30,774 acres of pinyon-juniper woodland, as proposed in Alternatives A and B respectively, would be lost. The energy represented in the 10,250 or 4,616 cords of fuelwood that would be available from treating this acreage could be recovered by commercial companies or by the public.

THE RELATIONSHIP BETWEEN SHORT-TERM USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

In the context of this section, short term generally refers to the life of the project, and long term is that period beyond the life of the project. Since livestock grazing is expected to continue in perpetuity, the life of the project (proposed management) does not fit the definition for short term. Therefore, the short-term uses of man's environment will be considered that time period from implementation of the management program until systems, treatments, and other managment actions have become established or produced a noticeable effect (approximately 20 years). Long term is the period beyond that point.

The proposed short-term changes in season of use, restriction of livestock grazing, reduced forage allocations, and vegetation manipulation projects would reduce rancher income and, in some areas, reduce wildlife populations in the short term. The purposes of these actions are to reduce grazing levels to carrying capacity, and to make better multiple use of the rangeland resources while protecting other critical resources. In the long term, rangeland productivity would increase, and livestock and wildlife productivity would be maintained or increased. A long-term improvement in soil erosion rates, sedimentation, streambank stability, and water quality would be expected. Salinity contribution to the Colorado River from overland runoff would be reduced.

The short-term use of conversion of pinyon-juniper and sagebrush sites to grass, forb, and browse production would result in a long-term increase in forage productivity on those sites.

The short-term use of rangeland as presently managed (Alternative D, No Action) would maintain existing wildlife levels and rancher income, but in the long term rangeland forage production and condition would decline, and reductions in livestock herds and big game herds would be necessary to protect the resources. Beneficial long-term impacts of the proposed actions described above would not be realized.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

The term "irreversible" refers to those actions or events that cannot be reversed. The term "irretrievable" means irrecoverable; once used, it cannot be replaced.

Approximately 79,000 acres (Alternative A) of pinyon-juniper and sagebrush vegetation types, or 38,751 acres (Alternative B) would be lost. If these areas are maintained according to policy, the acreage of these types would be irretrievably lost and irreversibly committed to grass, forb, and browse production. The fuel used to implement these projects would be irretrievable.

Soil lost through erosion would be irretrievably lost, but the rate and trend could be reduced or reversed. Fuelwood harvested from vegetation manipulation areas would be irretrievable.

Decreased livestock stocking rates and other restrictions resulting in reduced livestock sales would cause an irretrievable loss of income to livestock operators. This loss could be reversed in the long term.

The inadvertent damage or disturbance to cultural resources would result in an irretrievable loss of artifacts or context of sites. The irretrievable loss of archaeological sites would deplete or alter the nonrenewable cultural resource base. Mitigation by salvage of sites, rather than avoidance, would also be an irretrievable commitment of those sites that would be affected.

CHAPTER 4

CONSULTATION & COORDINATION

PUBLIC INVOLVEMENT

Efforts to involve the public in the MFP and EIS and to obtain input included public meetings, meetings with organizations and individuals, radio talk shows, news releases, and mailings to individuals. In early 1978, at the beginning of the SVIM inventory, livestock operators were invited by letter to a meeting held to acquaint them with the inventory scope and methodology. Personnel from the Resource Area participated in a Price River EIS Rancher Workshop held at College of Eastern Utah on March 28, 1980. Other participants included Utah State Extension Service, Utah Department of Natural Resources, and the Utah Department of Agriculture. During the summer of 1980, questionnaires requesting ranch economic data were sent to 84 permittees, and 69 replies were received. On October 16, 1980 and January 27, 1982, Resource Area personnel discussed planning and the grazing management EIS on a radio talk show on Price radio stations KOAL and KARB. A public scoping meeting was scheduled, and letters inviting the recipients to the meeting or to submit written comments were sent to 224 persons. The meeting was also advertised by news release and a Federal Register notice.

Issues Raised at Public Meetings

The following issues were raised at public meetings and in written comments: (1) ORV management and the possibility of closing some areas to ORV use, (2) continuation of the present fuelwood and Christmas tree permit system, (3) management of WSAs within the Resource Area, (4) conflicts between livestock grazing and boater use on the Green River, particularly in Desolation Canyon, (5) the deterioration of water quality in the area resulting from a variety of uses, (6) forage demand conflicts between livestock and wildlife, (7) possible competition with livestock from proposed big game reintroductions in the area, (8) the conflict of mining and energy developments with livestock grazing, (9) UDWR's management of deer herds on public lands, (10) the predator control program as it affects livestock operators, and (11) the number of restrictions placed on exploration and development of minerals, oil, and gas. Some of these issues do not relate specifically to the proposed grazing management program discussed in this EIS.

Alternatives Considered But Not Analyzed

No other alternative grazing management proposals were suggested in public meetings or in meetings with individuals or agencies. The alternative, "Elimination of Livestock Grazing" was considered by the interdisciplinary team, but was not included in this EIS. Total elimination of livestock grazing on all allotments in the EIS area would not be consistent with BLM policy as established by law (Taylor Grazing Act, 1934; Public Rangelands Improvement Act of 1978; and Federal Land Policy and Management Act of

1976). Where necessary, elimination of livestock grazing has been proposed on individual allotments or specific areas within allotments (under other alternatives), and the impacts of these proposals have been analyzed.

Date of Notice of Intent in Federal Register

A notice of intent to prepare an EIS on the grazing management program for the Price River Resource Area was printed in the *Federal Register* December 18, 1981.

Public Scoping Meeting

A public scoping meeting was held February 3, 1982 in the Price River Resource Area Office in Price, Utah. The meeting was advertised by newspaper, radio, *Federal Register* notice, and letters to individuals who expressed interest or might be affected by the proposed planning and grazing management program. Fifty-nine persons attended the meeting, and this group represented a broad range of interests. The following groups were represented at the meeting: Federal, State, and local government agencies; mining and energy industry; livestock industry; recreationists; wilderness advocates; League of Women Voters; and news media.

AGENCIES AND ORGANIZATIONS CONSULTED

In addition to the public contacts outlined previously, the interdisciplinary team also consulted with other individuals, agencies, and organizations having interest, expertise, or jurisdiction. Meetings to coordinate planning were held with personnel from BLM and Forest Service districts that have contiguous lands. The Soil Conservation Service and Bureau of Reclamation were consulted about proposed salinity studies on the Price and San Rafael rivers, and the effects of livestock grazing on salinity in the area. The Fish and Wildlife Service was consulted regarding threatened or endangered species in the area and any effects of proposed grazing management on species present.

A meeting was held with personnel from the Southeastern Regional Office of UDWR. Big game numbers, proposed reintroductions, sensitive, threatened or endangered species, and wildlife use areas were discussed. At a meeting with representatives from the Southeastern Utah Association of Governments, the issue of commercial and private fuelwood gathering was raised. The cost effectiveness of big game reintroductions, and ORV management in relation to water quality were also discussed.

A BLM representative attended the Utah Chapter of Western River Guides Association convention in Salt Lake City and invited input on grazing management and livestock use along the Green River. Meetings were also held with the Price River Watershed Soil Conservation District Board and the East Carbon Wildlife Federation to acquaint them with proposed grazing management alternatives for the area. Letters soliciting comments or identification of issues were sent to the Bureau of Indian Affairs Office and the Ute Tribal Council Chairman at Fort Duchesne. There were no replies to this correspondence.

LIST OF AGENCIES, ORGANIZATIONS AND PERSONS TO WHOM COPIES OF THE STATEMENT ARE SENT AND COMMENTS REQUESTED

Comments on the Draft Environmental Impact Statement will be requested from the following agencies, organizations, and persons.

Federal

Advisory Council on Historic Preservation

Agricultural Stabilization and Conservation Service

Bureau of Reclamation

Environmental Protection Agency

Forest Service

Fish and Wildlife Service

Geological Survey

Soil Conservation Service

Regional Solicitor

State of Utah

Clearing House (A-95)

Department of Agriculture

Department of Natural Resources

Division of History (State Historic Preservation Officer)

Division of Lands and Forestry

Division of Water Rights

Division of Wildlife Resources

Utah State University Extension Service

Local Agencies

Carbon County Commission

Emery County Commission

Price River Watershed Soil Conservation District

Southeastern Utah Association of Governments

Other Organizations or Persons

Ada County Fish and Game League

American Motorcyclist Association

Audubon Society

Brigham Young University

National Mustang Association

Natural Resources Defense Council

Public Lands Institute

Sierra Club

Carbon County Extension Agent

Carbon-Emery Wildlife Federation

Carbon-Emery Woolgrowers

Defenders of the Outdoor Heritage

East Carbon Wildlife Federation

Eastern Utah Cattle Growers

Emery County Extension Agent

Environmental Defense Fund

Friends of the Earth

Livestock Operators

National Humane Society

Moab District Grazing Advisory Board

Slickrock Outdoor Society

The Wilderness Society

Utah Cattlemen's Association

Utah Farm Bureau

Utah Wilderness Association

Utah Wildlife and Outdoor
Recreation Federation

Utah Wool Grower's Association

Wild Horse Organized Assistance

Western River Guides Association

APPENDIXES

APPENDIX 1

CULTURAL RESOURCES

MEMORANDUM OF UNDERSTANDING

PRICE RIVER GRAZING MANAGEMENT ENVIRONMENTAL IMPACT STATEMENT

BETWEEN

THE BUREAU OF LAND MANAGEMENT

AND

THE UTAH STATE HISTORIC PRESERVATION OFFICER

I. PURPOSE

The Bureau of Land Management, hereinafter referred to as the Bureau, is preparing the Price River Grazing Management Environmental Impact Statement (Price River EIS) under the provisions of the National Environmental Policy Act of 1969. The Bureau has determined that cultural values could be damaged or lost as a result of actions proposed in the Price River EIS. The following kinds of actions are proposed on public lands administered by the Bureau:

a. Fenceline construction
b. Vegetation Modification (e.g., chaining)
c. Water development

The Bureau has the responsibility to protect the cultural values on the lands administered by the Bureau. The Utah State Historic Preservation Office, hereinafter referred to as the State, is available to assist and advise those working with these federal regulations. In this MOU, "cultural resources" means data and sites which have archaeological, historical, architectural, or cultural importance and interest.

The Bureau requires investigators to be qualified to evaluate these "cultural resources".

II. AUTHORITY

This MOU is authorized under the Federal Land Policy and Management Act of 1976 and the National Historic Preservation Act of 1966. It is in accord with Bureau policies and programs.

III. RESPONSIBILITIES AND PROCEDURES

The Bureau complies with 36 CFR 800 in identifying sites which are listed in or eligible for inclusion in the National Register of Historic Places.

A. As part of the planning and environmental analysis required prior to major grazing management decisions, literature and records searches have been conducted for all public lands that would be affected by the Price River proposal.

B. After completing the planning and environmental analysis process, should the proposed management be implemented, the Bureau will inform project participants of, monitor compliance with, and enforce the following stipulations:

1. Prior to initiation of ground-disturbing activities, updated literature searches and intensive surveys will be undertaken for all areas which would be disturbed.

2. Wherever possible and feasible, cultural resources will be avoided by construction and related activities. This will be accomplished mainly by regulating vegetation modification activities and adjusting the location of other facilities such as pipeline and fences. Significant cultural resources facing inundation due to proposed reservoir construction will be salvaged to recover data that would otherwise be lost.

3. A professional archaeologist may be required to be present when ground-disturbing operations are underway.

4. Subsurface cultural resources that are encountered during any construction will be salvaged if there is no other recourse in such a situation.

C. Wherever it is not possible and feasible to avoid sites that contain cultural values, the Bureau will require the most satisfactory means of mitigating damage, as required by 36 CFR 800.

D. The Bureau will provide cultural resource reports, technical reports, and other pertinent material to the State so that the State can maintain a central depository of reports which will insure that no duplication will be required by the Bureau in the future.

IV. IMPLEMENTATION

A. This MOU will become effective on the date of the last signature on this MOU.

B. Either party may request revision or cancellation of this MOU by written notice, not less than 30 days prior to the time when such action is proposed.

C. Any problems resulting from this MOU which cannot be resolved by the Bureau in consultation with the State will be referred to the Secretary of the Interior and the Advisory Council on Historic Preservation for resolution.

D. Nothing in this MOU should be constructed as the State requiring compliance with federal regulations. The purpose of this MOU is to make the State aware of current federal procedures and regulations. These procedures will also allow copies of reports to be made available for central filing, so work is not unnecessarily duplicated.

Date 4/30/82

Gene Nodine

Moab District Manager
Bureau of Land Management
Department of the Interior

Date 5-10-82

Melvin T Smith

Utah State Historic Preservation Officer

APPENDIX 2

METHODOLOGY FOR CATEGORIZATION OF ALLOTMENTS

Allotments were categorized into selective management categories (Maintain, Improve, Custodial) using criteria developed from BLM Washington Office Instruction Memo 82-292 as basic guidance. An interdisciplinary team approach was used to make this general policy guidance specific to the EIS area. Data for each allotment was entered on Form MDO-060-4100-1 (sample follows). These completed allotment analysis forms were then used to categorize the allotments using a dichotomous key developed by the BLM Moab District. A copy of this M.I.C. Key is also included in this appendix.

Documentation of the category determination for each allotment is on file in the BLM Price Area Office.

ALLOTMENT ANALYSIS

Form MDO-060-4100-

Allotment Category ____________
Date ____________
Analyzed by ____________
____

State ____________
District ____________
Resource Area ____________
Planning Unit ____________ No. ____________
Allotment Name ____________ No. ____________ No. Operators ____________

Livestock No. ____________ Class ____________ Kind ____________
Season of Use ____________
No. Pastures ____________ Management System ____________

Land Status/Ownership Pattern
Acres PL ____________ %PL ____________ Largest Block PL Acres ____________
Acres SL ____________ %SL ____________ Largest Block SL Acres ____________
Acres Other ____________ % Other ____________ Remarks ____________

Conflicts in Land Use with Present Livestock Management

NOTE:
○ No conflict
− Potential conflict
X Direct conflict
+ Complimentary

Lands	Minerals	Vegetation	Water	Wildlife	Recreation	Wilderness	WH&B	Forestry	Fire Management	Community Development	Road Systems	Other

Type of Conflict ____________
Significance of Conflict ____________
Production Potential ____________ AUMs Increase in Allotment ____________
Range Condition/Trend: Condition ____________ Trend ____________

Management Opportunities
Grazing System Change

Range Improvements
Livestock Management Facilities
Vegetation Manipulation
Consolidate Allotments
Change of Season of Use
Change Class of Livestock
Adjustment in Use Authorization

Access
Legal Needed
Physical Needed
Other

Investment - Apparent *effectiveness

B/C Ratio - Management Opportunities

Source of Funding	"M"	"I"	"C"
Private Investment	✓	✓	✓
8100 Funds	✓	✓	✓
Advisory Board Funds	✓	✓	✓
FLPMA Funds		✓	
PRIA Funds		✓	
Other Funding (Specify)		✓	

Remarks

*Note: Detailed Benefit Cost Ratio will be determined at time AMP is developed for allotments. Close dollar estimate will be calculated then.

M.I.C. KEY FOR DETERMINING MANAGEMENT CATEGORIES OF ALLOTMENTS

LAND STATUS	CONFLICTS IN LAND USE	PRODUCTION POTENTIAL	RANGE CONDITION	TREND	MANAGEMENT OPPORTUNITIES CATEGORIES FOR IMPROVEMENTS
Less than 30% PL. scattered tracts					"C"
Consolidated tracts	No Conflicts				"C"
	Insignificant Conflicts				"M"
	Significant Conflicts	Low to None			"C"
		Medium to High	Poor to Fair	Improving	"C"
				Static	"C"
				Declining --- Low	"M"
				Medium to High	"I"
			Good to Excellant	Improving	"C"
				Static	"M"
				Declining --- Low	"M"
				Medium to High	"I"
More than 30% PL.	Significant Conflicts				"I"
	None or Insignificant Conflicts	Low to None			"C"
		Medium to High	Poor to Fair	Improving	"C"
				Static	"M"
				Declining --- Low	"M"
				Medium to High	"I"
			Good to Excellant	Improving	"C"
				Static	"M"
				Declining --- Low	"M"
				Medium to High	"I"

NOTE: There may be exceptions where an allotment will not fit this key.

Benefit/Cost criteria will be used to help prioritize allotments in each category

By Dave Hansen, Moab BLM

Explanation of "M.I.C. Key for Determining Management Categories of Allotments".

Definition of Categories:

"M" - Maintenance - No serious problems on the allotment. Intensive management can be delayed.

"I" - Improvement - Allotment needs attention. More intensive management/improvements is/are needed.

"C" - Custodial - Management opportunities are limiting.

Criteria used in the M.I.C. Key to determine which category each of the allotments should be placed: These criteria are used in priority order:

Land Status/Ownership Pattern

Conflicts or Lack of Conflicts on the Public Land

Production Potential

Range Condition/Trend

Management Opportunities

Investment Opportunities - i.e. benefit vs. cost

Professional judgement will be used where Resource Data is not available.

Land Status/Ownership Pattern (% PL)

Allotments should be arranged by %PL acres to find the Natural Breaking Points. An allotment with 30% public land will not of itself be a limiting factor as to what category the allotment will be placed in: e.g. scattered tracts of public land with acreages of less than 320 acres (more or less) in each tract would not generally lend itself to effective management. Even if these scattered tracts totaled 2400 acres, whereas, should all the land be blocked up they may be so located where intensive management would be desirable.

Conflicts in Land Use

- are to be identified via planning system or other documentation.
- failing to have that, use professional judgement using multiple discipline approach.

Production Potential

- is to be identified by information obtained via SVIM;
- if lacking that, use any other acceptable inventory;
- or multiple discipline approach (professional judgement).

Range Condition

- is to be identified by SVIM;
- lacking that, use any other acceptable inventory;
- or by multiple discipline approach (professional judgement).

Range Trend

- is to be determined by an evaluation of studies located on the ground;
- lacking that, use apparent trend procedures.

Management Opportunities

- will be determined by multiple discipline approach (professional judgement).

Investment Opportunities

- will be determined via the benefit/cost analysis. This will generally be used to determine priorities for implementation of RI and initiating intensive management;
- contributed funds may be invested at the discretion of the contributor;
- multiple discipline approach will be used to identify the benefit vs. costs associated with each allotment.

A justification is to be written to explain why the allotment is placed in one category or another.

Explanation of Terms Used in the "Key"

Conflicts

Significance - Determined by threshold levels for each resource. Is to be identified for each allotment on Allotment Analysis form used t identify allotment category.

Production Potential

"Low" opportunity to increase production, i.e.
e.g. 35 acres/AUM to 30 acres/AUM

Medium to high opportunity to increase production, i.e.
e.g. 20 acres/AUM to 5 acres/AUM

Range Condition

This is to be determined as per BLM Range Manual.

Management Opportunities

Low - There is not much opportunity for management, i.e. too steep and rugged. Allotment too small, resources are such they would not respond to management.

Medium to High - Resource allow for change in season of use. Waters are needed and can be developed. Additional fences for more intensive management will help, etc.

APPENDIX 3

METHODOLOGY FOR ALLOCATING VEGETATION TO LIVESTOCK, WILDLIFE, AND WILD HORSES

Vegetation was allocated to competing ungulate grazing animals in the Price River EIS area by using a computer vegetation allocation model developed by the BLM's Denver Service Center.

1.0 ALLOCATION MODEL

The vegetation allocation model is a linear programming (LP) model. The basis of an LP model is an objective function and a set of constraints. The objective function is something that is maximized (or minimized, depending upon the problem). The set of constraints restricts the objective function. As the term linear programming suggests, all relationships are assumed to be linear.

A detailed explanation of the vegetation allocation model exists as a technical paper: A Linear Programming Model for Vegetation Allocation to Herbivores Using PUFs and AUFs (Martinson and MacPherson, 1979). This paper is available through the Denver Service Center, Division of Data Base Administration, Branch of User Design (D-212), Denver, Colorado 80225.

The vegetation allocation model seeks to maximize the use of forage for grazing, subject to the constraints of animal forage preference (PUF), plant maintenance (AUF), diet, animal numbers, equality, and management.

The following is the formulation of the basic model:

Objective Function

$$\text{Max} \sum_{i}\sum_{k} r_i \, m_{ik} \, x_{ik} \qquad 1.1$$

SWA Level Constraints (subscript k dropped for clarity of presentation)

$$f_{ij} \leq PUF_{ij} \text{ for each plant } j \text{ and animal } i \qquad 1.2.1$$

$$f_{ij} \, V_j S_i \leq (1+DRF)(RPV_{ij}) \, r_i \, m_i \, x_i \qquad 1.2.2$$

for each plant j and animal i

$$f_{ij} \, V_j S_i \geq (1-DRF)(RPV_{ij}) \, r_i \, m_i \, x_i \qquad 1.2.2$$

$$x_i = \frac{1}{m_i \, r_i} \; {}_{j} \; f_{ij} \, V_j \, S_i \text{ for each animal } i \qquad 1.2.3$$

$${}_{i} \; f_{ij} \leq AUF_j \text{ for each plant } j \qquad 1.2.4$$

Allotment Level Constraints

$$X_i = \sum_{k} x_{ik} \text{ for each animal } i \qquad 1.2.5$$

$$X_i \leq U_i \text{ for each animal } i \qquad 1.2.5$$

$$X_i \geq L_i \text{ for each animal } i \qquad 1.2.5$$

1.1 Objective Function

$$\text{Max} \sum_{i}\sum_{k} r_i \, m_{ik} \, x_{ik}$$

where: x_{ik} = number of animals of type i in SWA k

m_{ik} = number of months that animal type i is present in SWA k

r_i = pounds of forage required per month by animal type i

i.e., Maximize the pounds of forage consumed by all animals in an allotment. This can be illustrated using the units of measure.

pounds/animal-month (r_i) x months (m_{ik}) x animals (x_{ik}) = pounds;

Monthly forage requirements used for the Price River EIS are as follows:

Antelope	85 pounds
Cattle	800 pounds
Deer	90 pounds
Elk	390 pounds
Horses	1,000 pounds
Bighorn Sheep	145 pounds
Domestic Sheep	130 pounds
Moose	670 pounds

1.2 Constraints

The constraints fall into two categories: SWA level and allotment level. Constraints 1.2.1, 1.2.2, 1.2.3, and 1.2.4 are SWA level constraints. In each of these constraints the k subscript could have been added to each item but was omitted for clarity of presentation. The management constraints described in part 1.2.5 are operational on the allotment level.

1.2.1 Animal Forage Preference - Proper Use

$f_{ij} \leq PUF_{ij}$ for each plant j and animal i

where: f_{ij} = fraction of annual growth of plant species j consumed by animal type i over m_i months of grazing

PUF_{ij} = proper use factor of plant species j by animal type i for m_i months of use.

i.e., the fraction of a plant consumed by an animal type cannot exceed that animal's preference for that plant.

1.2.2 Dietary Constraints

Dietary constraints require each animal to consume a complete diet and enable the decisionmaker to place a range of acceptable values on the diet preference estimates as follows:

$f_{ij}\ V_j S_i \leq (1+DRF)(RPV_{ij})\ r_i\ m_i\ x_i$ for each plant j and animal i

$f_{ij}\ V_j S_i \geq (1-DRF)(RPV_{ij})\ r_i\ m_i\ x_i$ for each plant j and animal i

where: f_{ij} = fraction of annual growth of plant species j consumed by animal type i over m_i months of grazing

V_j = pounds of annual production of plant species j

S_i = fraction of land suitable for grazing by animal type i

r_i = pounds of forage required per month by animal type i

m_i = number of months animal type i is present

X_i = number of animals of type i

RPV_{ij} = relative preference value for plant species j* by animal type i

DRF = dietary range factor

i.e., The pounds of a plant an animal consumes must be approximately the pounds that animal prefers. The relative preference value (percent in diet) is allowed to vary within certain limits, the value of which is specified by the dietary range factor. For example, the RPV of BØGR2 is 0.25 ± (0.10 x 0.25). That is, it ranges from 0.225 to 0.275.

Note that suitability affects the model by reducing the pounds of annual production for a SWA by the percent of the SWA that is unsuitable for a particular animal type. Also the "limited suitability" and "potentially suitable" classifications do not enter the model.

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*RPVs that result from dietary studies may be entered directly or the model will calculate them using PUFs as follows:

$$RPV_{ij} = \frac{PUF_{ij}}{\sum_j PUF_{ij}} \quad \text{for each plant j and animal i}$$

i.e., Since PUFs are a readily available source of dietary preference estimates, they are used to estimate relative preference values (percent in diet).

1.2.3 Animal Numbers Equality Constraint

$$x_i = \frac{1}{m_i \; r_i} \sum_i f_{ij} V_j S_i \quad \text{for each animal } i$$

where: x_i = number of animals of type i

m_i = number of months that animal type i is present

r_i = pounds of forage required per month by animal type i

f_{ij} = fraction of annual growth of plant species j consumed by animal type i over m_i months of grazing

V_j = pounds of annual production of plant species j

S_i = fraction of land suitable for grazing by animal type i

i.e., The number of animals is equal to the total pounds of forage consumed, divided by the forage requirement (in pounds per animal-month).

1.2.4 Plant Maintenance - Allowable Use

$$\sum_i f_{ij} \leq AUF_j \quad \text{for each plant } j$$

where: f_{ij} = fraction of annual growth of plant species j consumed by animal type i over m_i months of grazing

AUF_j = allowable use factor of plant species j i.e., The total fraction of a plant species consumed by all animals cannot exceed the allowable use of that plant.

1.2.5 Management Constraints

Management constraints enable the decisionmaker to set a minimum and a maximum number of animals at the allotment level as follows:

$$X_i = \sum_k x_{ik} \text{ for each animal } i$$

$$X_i \leq U_i \text{ for each animal } i$$

$$X_i \geq L_i \text{ for each animal } i$$

where: X_i = number of animals of type i in allotment

x_i = number of animals of type i in SWA

U_i = maximum number of animals of type i

L_i = minimum number of animals of type i

i.e., The number of animals in the allotment is equal to the number of animals in all the SWAs and must be less than the upper bound and more than the lower bound.

1.2 Strategy for Establishing Management Constraints for each Alternative

Maximum and minimum numbers for each species of animal were established for each alternative and each allotment using the following table:

Alternative	Animal	Maximum	Minimum
Enhance Livestock[1]	Domestic stock	9999	Existing numbers
	Wildlife	Existing numbers	0
Proposed Action[1]	Domestic stock	9999	0
	Wildlife	9999	0
Enhance Watershed[1], Wildlife and Recreation	Domestic stock	Existing numbers	0
	Wildlife	9999	Existing numbers
No Action[2]	Domestic stock	9999	0
	Wildlife	9999	0

[1] Assumes proposed season of use

[2] Assumes existing season of use

APPENDIX 4

Allocation of Vegetation to Livestock and Wildlife by Allotment

Category	Allotment	Existing Livestock Use				Existing Situation					Alternative A Enhance Livestock Production					Alternative B Planning Recommendation					Alternative C Enhance Watershed, Wildlife, and Recreation				
		Active Preference		Licensed Use (Avg.)																					
		C	S	C	S	C	S	D	A	O	C	S	D	A	O	C	S	D	A	O	C	S	D	A	O
C	AIRPORT	20	0	20	0	91	----	114	29	----	52	161	26	0	----	52	----	103	29	----	40	----	120	29	----
	ALLRED NORTH	18	0	18	0	0	----	105	----	22	1	----	5	----	0	0	----	105	----	22	0	----	165	----	22
	ALLRED SOUTH	0	120	0	70	0	111	82	----	----	23	19	12	----	----	----	109	83	----	----	23	----	83	----	----
	ANDERSON	0	0	0	0	64	151	28	----	----	85	201	12	----	----	----	----	28	----	----	0	0	158	----	----
	BLIND CANYON	30	0	21	0	19	----	1240	----	305	59	185	195	----	6	52	----	1135	----	279	20	----	1240	----	302
	BOX FLAT	410	0	348	0	465	2611	2770	----	2612	1077	6793	256	----	0	1148	0	7797	----	5348	778	0	7802	----	5710
	BROWN	15	0	12	----	2	----	10	----	----	12	33	0	----	----	12	----	55	----	----	12	----	55	----	----
	BUCKSKIN	156	0	147	0	24	----	252	----	73	20	181	7	----	0	22	----	253	----	74	10	----	253	----	74
	CALF CANYON	199	0	148	0	106	----	338	----	36	149	791	73	----	0	215	----	841	----	117	114	0	838	----	326
	CANAL CATTLE	8	0	2	0	0	----	1	----	----	5	55	0	----	----	5	----	26	----	----	5	----	26	----	----
	CLEVELAND WINTER	419	0	319	0	284	----	847	1716	----	296	62	62	104	----	284	----	847	1716	----	284	----	847	1716	----
	CLOSED TO GRAZING	0	0	0	0	----	----	2142	----	----	535	4193	192	----	----	----	----	2142	----	----	0	----	2432	----	----
	DUGOUT	30	0	24	0	6	----	152	----	70	11	58	56	----	0	12	----	135	----	183	12	----	62	----	184
	ELMO	102	0	67	0	96	----	198	453	----	92	25	22	22	----	100	----	198	453	----	91	----	199	454	----
	ERRAMOUSPE	0	10	0	10	----	0	0	----	----	----	3	0	----	----	----	3	0	----	----	----	3	2	----	----
	FAUSETT	0	80	0	70	----	21	12	----	----	5	25	17	----	----	----	27	43	----	----	0	0	45	----	----
	FISH CREEK	25	0	25	0	8	----	19	----	43	9	60	99	----	20	8	----	77	----	41	8	----	105	----	37
	GRASSY TRAIL	0	250	0	50	----	189	128	164	----	30	257	12	12	----	20	141	107	156	----	16	----	120	73	----
	GREEN RIVER SOUTH	0	1300	0	0	----	6333	4914	----	----	926	8432	119	----	----	1245	----	4887	----	----	0	2460	4914	----	----
	JENSEN	20	0	20	0	14	----	55	----	----	15	22	0	----	----	15	0	59	----	----	15	----	59	----	----
	JOHNSON HUFF HOLLOW	213	0	138	0	18	----	105	----	----	116	340	91	----	----	130	0	109	----	----	20	----	155	----	----
	KEEL	30	0	24	0	25	----	456	----	112	28	154	51	----	10	25	----	107	----	28	4	----	104	----	16
	MARAKIS	0	80	0	80	----	7	15	----	12	2	11	24	----	0	----	19	33	----	24	----	2	21	----	12
	MARSING	87	435	----	110	60	152	253	----	0	65	127	12	----	----	60	169	257	----	----	62	----	269	----	----
	MATHIS WASH	301	0	241	0	335	----	185	0	----	279	1076	0	48	----	326	----	819	745	----	212	----	845	750	----
	MAX CANYON	20	0	20	0	0	----	62	----	----	4	29	20	----	268	4	----	40	----	----	4	----	40	----	----
	MILLER CREEK	585	0	348	0	367	----	735	----	----	502	3929	568	----	----	542	----	1267	----	----	229	----	1343	----	----
	NORTH OLSEN LAKE	221	0	101	0	246	----	383	609	----	234	467	48	24	----	166	----	199	345	----	166	----	199	345	----
	OVIATT	63	0	62	0	40	----	174	----	----	42	76	12	----	----	42	----	172	----	----	42	----	172	----	----
	PACE CANYON	80	0	16	0	6	----	203	----	82	9	58	107	----	6	7	----	232	----	140	7	----	232	----	140
	PATHOS	47	0	46	47	8	----	259	----	100	11	82	84	----	3	15	----	444	----	136	9	----	444	----	137
	PETERSON	0	0	0	0	12	22	46	----	----	11	27	0	----	----	----	----	46	----	----	0	0	47	----	----
	RANGE MOUNTAIN	120	0	89	0	20	----	78	----	21	13	109	16	----	2	21	----	86	----	23	7	----	93	----	39
	RIMROCK	45	0	37	0	13	----	197	----	64	33	15	78	----	0	29	0	238	----	41	27	----	238	----	113
	SMITH	49	0	0	0	9	----	33	----	----	60	302	24	----	----	63	----	141	----	----	6	----	141	----	----
	STAKER	70	0	48	0	47	----	187	----	----	41	190	12	----	----	49	----	187	----	----	35	----	187	----	----
	VICTOR	152	0	116	0	289	----	610	945	----	281	534	56	78	----	284	----	605	918	----	6	----	628	965	----
	WASHBOARD	601	0	523	0	102	----	477	----	----	627	20	71	----	----	624	----	2994	----	----	525	----	2350	----	----
	WELLINGTON	0	500	0	0	7	0	12	----	----	1	186	2	----	----	33	42	76	----	----	0	184	90	----	----
	BEAR CANYON	100	0	100	0	4	----	188	----	46	23	150	116	----	7	21	----	860	----	228	7	----	884	----	232
	BENCH	88	0	88	0	61	----	140	110	----	56	169	96	12	----	47	----	135	109	----	22	----	112	169	----
	BIG SPRING	48	0	48	0	98	----	343	499	----	55	270	12	24	----	37	----	111	167	----	22	----	112	169	----
	BUCKMASTER	858	0	475	0	1073	----	4988	4891	870	2451	16402	555	0	0	2614	----	12355	6345	888	0	0	12395	6345	933
	CAT CANYON	0	860	0	0	----	203	128	223	----	3	191	5	36	----	29	0	114	247	----	29	0	114	247	----
	CHIMNEY ROCK FLAT	1200	0	793	0	234	----	1650	1748	----	1069	4403	269	30	----	1713	----	6292	11594	----	122	----	4435	6475	----
	CHURCH FLAT	0	1500	0	310	----	275	109	259	----	112	952	108	108	----	130	0	206	287	----	130	0	206	287	----
	CLARKS VALLEY	567	0	530	0	249	----	532	1824	----	352	1255	38	115	----	210	0	457	1582	----	200	0	530	1903	----
	CLEVELAND SUMMER	1833	0	1633	0	989	----	1761	1153	----	1010	1260	463	120	----	1010	----	1826	1080	----	971	----	1750	1081	----
	COAL CREEK	933	----	933	----	450	0	1178	253	314	461	2155	1054	16	81	452	0	1659	----	439	304	0	2466	439	238
	COLUMBIA	225	0	18	0	126	----	422	----	----	209	0	0	0	0	198	----	538	----	----	176	----	770	----	----
	CONSUMERS WASH	0	2550	0	1160	----	1744	859	----	239	223	2431	916	----	63	417	0	873	----	190	257	0	1132	----	230
	EOON SPRINGS	316	0	94	0	253	----	998	1294	----	471	3815	65	101	----	523	----	2183	2692	----	78	----	2296	2730	----
	CORNER	53	0	11	0	47	----	167	----	1	47	45	119	----	12	46	----	324	----	38	38	----	344	----	37
	COVE	750	0	218	0	604	----	693	1978	----	2114	10342	61	221	----	2117	----	2877	8174	----	704	----	3052	9682	----
	EOW CANYON	103	0	93	0	4	----	73	----	47	40	317	112	----	3	39	----	440	----	90	39	----	449	----	291
	CRANDALL CANYON	104	520	46	225	30	111	274	----	360	28	134	267	----	266	27	0	278	----	367	26	0	297	----	358
	DRIPPING SPRINGS	1029	0	838	0	481	----	1242	498	----	740	1767	250	71	----	740	----	1890	714	----	740	----	1890	714	----

NOTE: C = Cattle; S = Sheep; D = Deer; A = Antelope; O = Other wildlife.

APPENDIX 4 (Concluded)

Category	Allotment	Existing Livestock Use				Existing Situation					Alternative A Enhance Livestock Production					Alternative B Planning Recommendation					Alternative C Enhance Watershed, Wildlife, and Recreation				
		Active Preference		Licensed Use (Avg)																					
		C	S	C	S	C	S	D	A	O	C	S	D	A	O	C	S	D	A	O	C	S	D	A	O
I	DRY CANYON	890	0	878	0	133	----	2060	----	925	140	803	684	----	4	111	----	2083	----	930	111	----	2083	----	930
	ELLIOT MOUNTAIN	513	4720	0	300	----	21339	20256	4521	8920	2239	12512	397	139	108	2984	----	15747	1821	4582	0	0	14202	3069	8261
	FAN CANYON	100	0	8	0	53	----	484	----	----	116	252	70	----	----	40	0	484	----	----	48	0	483	----	----
	FARNHAM	0	900	0	50	----	300	129	254	----	90	1088	84	120	----	249	0	299	1786	----	249	0	299	1786	----
	GORDON CREEK	0	0	0	0	300	787	1465	----	3	373	1054	1423	----	0	288	0	1448	----	3	288	0	1448	----	3
	GREEN RIVER NORTH	8584	0	5980	0	1220	----	12987	----	13845	2833	11598	9849	----	585	2169	----	21145	----	9384	1890	----	23864	----	9121
	HALEY CANYON	154	0	155	0	65	----	369	----	70	271	536	1569	----	39	257	0	1471	----	272	214	0	1728	----	177
	HAYES WASH	342	----	0	84	458	----	896	471	----	338	2078	826	0	----	458	0	831	476	----	166	0	505	526	----
	HIAWATHA	62	390	28	140	119	816	511	----	113	151	490	508	----	42	221	0	913	----	116	210	0	984	----	70
	HUMBUG	2857	0	1912	0	1127	----	3688	6179	----	867	2531	647	369	----	1452	----	6763	6473	----	824	----	3832	3865	----
	ICELANDER	2691	0	1371	0	2345	----	8881	15382	----	1564	3749	766	741	----	1974	0	8564	13801	----	1974	0	8564	13801	----
	IRIART	72	0	58	0	20	----	370	----	142	32	84	56	----	7	23	----	645	----	135	23	----	645	----	135
	KIMBALL CANYON	24	0	14	0	6	----	71	----	17	7	7	64	----	10	6	----	104	----	12	1	----	104	----	15
	KYUNE II	380	0	255	0	110	----	660	----	418	121	566	392	----	96	110	----	760	----	485	109	----	669	----	483
	LAST CHANCE	0	5250	0	0	----	2553	6022	----	3912	907	3759	4666	----	280	939	0	7462	----	4572	0	0	6595	----	4850
	LITTLE PARK	242	0	205	0	286	----	4224	----	1537	570	2005	2158	----	0	462	0	5002	----	1696	227	0	5160	----	1733
	MOUNDS	0	500	0	0	----	191	17	35	----	150	427	13	63	----	105	0	304	789	----	105	0	304	798	----
	MUD SPRINGS	2320	0	2041	0	1538	----	4359	6062	15	1321	2415	978	1	0	1337	0	2792	2664	21	922	0	3551	3449	21
	NORTH SPRING	0	2000	0	1040	----	3905	1679	----	171	116	201	132	----	8	197	0	1163	----	55	193	0	1178	----	56
	OIL WELL DRAW	461	0	239	0	503	----	1428	2660	----	1189	858	156	228	----	1153	----	2563	4859	----	120	----	2827	4875	----
	PINE CANYON	50	0	51	0	14	----	264	----	83	16	76	104	----	6	15	----	257	----	133	15	----	257	----	134
	PINNACLE BENCH	333	1655	57	1050	113	540	546	----	----	160	564	130	----	----	145	0	606	----	----	140	0	606	----	----
	POISON SPRING BENCH	930	4650	919	----	465	1365	2049	----	----	473	2176	456	----	----	437	2265	2317	----	----	441	1117	2493	----	----
	POLE CANYON	144	0	144	0	18	----	237	----	92	22	178	108	----	1	21	----	297	----	122	21	----	297	----	122
	PORPHYRY BENCH	290	1450	248	80	523	2670	1474	----	3	354	1617	535	----	0	351	0	1158	----	4	392	0	1263	----	0
	PRICE CANYON WEST	30	0	315	0	63	----	775	----	513	77	453	777	----	119	61	----	780	----	501	60	----	916	----	422
	PRICE RIVER NORTH	64	0	0	0	18	0	18	20	----	40	3	5	9	----	36	----	45	72	----	36	----	45	72	----
	PRICE RIVER SOUTH	40	0	32	0	52	----	328	----	175	69	1034	116	----	12	69	0	342	----	163	36	0	178	----	111
	RANGE CREEK	300	0	300	0	272	----	7982	----	1881	373	1124	5234	----	67	302	----	5044	----	2203	301	----	9229	----	2203
	RIVER	0	3000	0	0	----	2691	3709	----	3450	253	974	1156	----	32	253	0	1610	----	1302	0	0	1508	----	1235
	ROCK CANYON	16	0	12	0	4	----	222	----	60	3	31	16	----	0	4	----	273	----	60	4	----	273	----	36
	ROCK CREEK	1594	0	541	0	671	----	11375	----	5905	1307	5004	9421	----	323	937	----	17878	----	10732	643	----	17586	----	11065
	SAGE FLAT	332	0	221	0	159	----	731	----	----	178	564	0	----	----	178	----	800	----	----	138	----	821	----	----
	SHEEP CANYON	696	0	258	0	21	----	333	----	114	97	629	480	----	11	73	----	1480	----	545	72	----	1480	----	545
	SOLDIER CANYON	835	0	544	0	377	----	2495	576	----	487	2240	3267	70	----	364	0	2520	539	----	489	0	3601	855	----
	SOUTH OLSEN LAKE	251	0	201	0	129	----	238	490	----	41	189	12	----	----	121	----	238	491	----	121	----	238	491	----
	SPRING CANYON	212	1060	65	0	17	412	731	----	507	69	482	722	----	95	35	0	741	----	543	31	0	741	----	553
	STONE CABIN	1625	0	1393	0	400	----	2923	----	1073	499	2421	1521	----	36	408	----	3021	----	1103	119	----	2881	----	1608
	SULFUR CANYON	336	0	326	0	16	----	331	----	109	75	371	0	----	228	73	----	1386	----	388	54	----	1386	----	382
	SUMMERVILLE	1001	0	469	0	518	----	3410	990	----	1412	7388	510	261	----	713	----	3731	2349	----	348	----	4376	4373	----
	TRAIL CANYON	0	420	0	420	40	----	527	----	580	70	304	548	----	400	39	0	531	----	177	27	0	645	----	584
	WATTIS	100	0	103	0	82	----	681	----	391	87	248	537	----	259	77	0	578	----	408	49	0	709	----	426
	WILLOW CREEK	210	0	78	0	64	400	908	----	673	78	423	298	----	112	67	----	964	----	673	67	----	965	----	673
	WOODHILL	205	1025	0	0	20	298	307	----	11	92	282	377	----	4	70	274	307	----	11	70	----	307	----	10
	WOODSIDE	478	800	0	0	1269	4050	3061	2450	1505	1354	6165	698	0	45	1345	3599	4833	2493	1358	0	----	4684	2547	1489
	BEAVER CREEK	300	1500	60	900	41	254	397	----	124	49	188	380	----	84	27	172	309	----	102	45	----	405	----	155
	CANYON	100	0	48	0	106	----	983	----	----	97	365	318	----	----	97	----	984	----	----	96	----	984	----	----
	DEADMAN	24	0	19	0	43	----	232	----	375	39	171	83	----	14	40	----	224	----	375	35	----	266	----	350
	HUFF BENCH	160	0	138	0	109	----	181	----	----	105	27	43	----	----	168	----	231	----	----	84	----	108	----	----
	KYUNE 1	598	0	256	0	229	----	3536	----	1760	346	3851	1725	----	155	----	----	3539	----	1759	34	----	4607	----	1793
	LILA CANYON	0	0	0	0	----	----	357	----	----	38	244	68	----	0	24	175	357	----	176	----	----	649	----	179
	LONG BENCH	0	100	0	100	17	80	222	----	112	17	211	211	----	13	----	183	226	----	111	25	----	248	----	100
	LOOKOFF	80	0	61	0	102	----	204	----	----	98	40	51	----	----	101	----	203	----	----	85	----	206	----	----
	LUCKY LEMON FLAT	362	0	330	0	384	----	1318	----	----	598	2427	144	----	----	606	----	2554	----	----	109	----	2555	----	----
	MOHRLAND	75	0	75	0	178	----	969	----	49	178	508	919	----	3	178	----	820	----	30	164	----	1042	----	41
	MUDWATER	15	0	15	0	7	----	137	----	132	7	41	119	----	96	8	0	137	----	132	7	0	137	----	132
	NORTH CLARKS VALLEY	293	0	47	0	221	----	1500	82	----	254	1495	454	12	----	33	----	693	87	----	249	----	1610	83	----
	NORTH HOLLOW	12	0	11	0	5	----	220	----	69	15	43	40	----	7	6	----	259	----	71	6	----	259	----	71
	PRICE CANYON EAST	354	0	317	0	141	----	1563	----	1657	323	2036	1239	----	143	336	----	1679	----	1613	251	0	1667	----	1633
	TRAIL SPRING	596	2980	610	51	936	732	460	203	----	943	3789	283	178	----	913	3704	2944	1845	----	651	1742	3032	1849	----
	WILDCAT	0	350	0	70	----	116	278	----	448	22	132	275	----	64	----	127	277	----	510	----	123	301	----	424

NOTE: C = Cattle; S = Sheep; D = Deer; A = Antelope; O = Other wildlife.

APPENDIX 5

METHODOLOGY FOR DETERMINING WILDLIFE POPULATION ESTIMATES

Present and prior stable population estimates were calculated for each big game species by season of use and allotment (see Appendix 6). The following narrative and tables describe the basic procedures and assumptions used in developing these numbers.

The Utah Division of Wildlife Resources (UDWR) provided prior stable population estimates for each species by herd unit and season of use area, as follows:

TABLE 1

UDWR Prior Stable Population Estimates

Species	Herd Unit	Total	Critical Winter	Winter	Summer	Yearlong	High Density Yearlong
Mule Deer	27B	11,400	6,414	4,643	11,057	242	---
	29	3,068	---	---	---	2,968	100
	32	8,509	4,877	3,532	8,409	100	---
	33	4,541	2,576	1,865	4,441	200	---
Elk	12	4,600	3,685	920	4,600	---	---
	22	2,000	---	2,000	2,000	---	---
	Range Creek	800	---	800	800	---	---
Moose	4	487	---	---	---	487	---
Antelope	11	953	---	---	---	953	---
	9	370	---	---	---	370	---
Desert Bighorn	Elliot Mountain	352	---	---	---	352	---
	North San Rafael	1,444	---	---	---	1,444	---
Rocky Mountain Bighorn	Range Creek	673	---	---	---	673	---

UDWR seasonal use ranges differed from BLM data generated during the SVIM inventory; therefore, only herd unit totals were utilized. For mule deer these totals were subdivided into seasonal use ranges based on acreages developed from the SVIM inventory.

Mule deer herd units 32 and 33 were combined into one herd unit 32-33 to more closely resemble a natural herd. Total seasonal use acreages were divided into the numbers of animals occupying that range. The resultant acres per animal figure was used as the basis for allotment-specific estimates. Summer ranges and winter ranges support the total herd unit population minus yearlong resident deer. Concentrations of mule deer on winter and critical winter range differ significantly. Mule deer distributions on these ranges were determined for each herd unit through analysis of pellet group data collected from interagency browse utilization and pellet group transects. Established pellet group transects on each herd unit were identified as representing winter or crucial ~~critical~~ winter range based on range delineations generated during the SVIM inventory. Deer days use data from these pellet group transects were averaged over a 5-year period and compared. A ratio between winter and critical winter mule deer concentrations was determined as shown on Table 2.

TABLE 2

Average (1976-1980) Deer Days Use Per Acre and
Ratio Between Concentration of Use Areas

Herd Unit	Critical Winter[a]	Winter[b]	Concentration of Use Ratio Critical Winter/Winter
27B	30.9	7.1	4.352/1
32-33	59.3	36.9	1.607/1

[a] Transects Representing Critical Winter Range

Coal Creek (Cemo 2)
Little Park (Cemo 2)
Upper Little Park (Artr 2)
Porphyry Bench (Artr 2)
Porphyry Bench Reseed (Cemo 2)
Slack Pile (Artr 2)

[b] Transects Representing Winter Range

Pace Canyon
Rock Canyon
Cedar Ridge #1
Cedar Ridge #2
Bryner Ranch
Cottonwood Ridge
Lower Water Hollow
Harmon Canyon
Wiregrass Bench
Long Bench
Cedar Bench
Horse Bench
Telephone Bench

These ratios were applied to herd unit winter range acreages to determine the number of acres supporting one deer. The acres per animal figures for prior stable populations are presented in Table 3.

Present population estimates were derived from prior stable estimates using harvest and pellet group data. Harvest data were used in the following formula:

$$X = \frac{\text{UDWR Prior Stable Population Estimate X Average Harvest For Past 5 Years}}{\text{Average Harvest For Prior Stable Period}}$$

This formula gave a population estimate which was then converted into a percentage of the prior stable population level. Pellet group data was used similarly to calculate a percentage of the prior stable population level. The two percentages were then averaged to determine the percentage of the prior stable population. This percentage was then used to compute present population levels. This procedure is summarized in Table 4.

Average percentages of prior stable population levels were multiplied by the prior stable acres per animal figures for seasonal use range to determine present population acres per animal figures for seasonal use ranges as displayed in Table 3.

Harvest and pellet group data are lacking for all other big game species present in the EIS area; therefore, alternate methods were utilized to generate seasonal use acres per animal figures presented in Table 3. Acres per animal figures were calculated directly from UDWR seasonal use acreage and population data as applied to BLM acreages in the EIS area. Present population estimates were determined through subjectively estimating percent of prior stable population levels. These estimates were then multiplied by the acres per animal figures resulting in present population estimates of acres per animal as shown in Table 3.

TABLE 3

Wildlife Population Calculations/Price River Resource Area

Species	Herd Unit	Range	Acres Per Animal Prior Stable	Acres Per Animal Present	Percent of Prior Stable
Mule Deer	27B	DC	19.51	45.36	43
		DW	84.86	197.39	43
		DS	27.406	63.73	43
		DY	904.46	2,108.0	43
	32-33	DC	7.51	8.63	87
		DW	12.09	13.90	87
		DS	22.06	25.36	87
		DY	146.65	168.50	87
	29	DM	506.88	506.88	100
		DY	920.93	920.93	100
Elk	12	EC	29.27	36.59	80
		EW	292.0	365.0	80
		ES	100.47	125.59	80
	22	EW	292.0	584.0	50
		ES	100.47	200.94	50
	RC	EW	292.0	4,672.0	6
		ES	100.47	1,607.5	6
Moose	4	MY	3,500.0	17,131.57	20
		MC	45.0	220.26	20
Antelope	11	AN	305.0	643.72	47
	9	AN	0	0	---
Desert Bighorn	---	Elliot Mountain	145.0	5,104.0	3
		San Rafael	145.0	0	---
Rocky Mountain Bighorn	---	Range Creek	145.0	3,252.83	4

TABLE 4

PRESENT POPULATION ESTIMATE CALCULATIONS

Harvest Data Calculation

	Prior Stable			Present 5 Years				
Herd Unit	Period	Population Estimate	Average Harvest	Period	Average Harvest	Population Estimate	Percent of Prior Stable	Average Percent of Prior Stable
32-33	1961-74	13,050	1,181	1976-80	1,422	15,713	117	87
278	1961-73	11,400	1,097	1976-80	676	7,025	62	43

Pellet Group Data Calculation

Herd Unit	Period	Deer Days Use/Acre	Period	Deer Days Use/Acre	Percent of Prior Stable	Average Percent of Prior Stable
32-33	1962-74	34	1976-80	19	56	87
27B	1962-73	28.8	1976-80	6.6	23	43

APPENDIX 6

Big Game Prior Stable and Present Population Estimates by Species, Season of Use and Allotment

			Acres	Population Estimates[c] and Forage Demand: Prior Stable		Present	
Allotment/Pasture	Species Symbol[a]	Herd Unit	Surveyed[b]	Numbers	Forage Demand	Numbers	Forage Demand
4001/Airport	DY	27B	655	54	648	47	564
	AN	11	112	0	0	0	0
4002/Allred South	DY	29	235	1	12	1	12
4003/Allred North	EW	RC	145	1	6.5	0	0
	OW	27B	145	2	13	1	6.5
	MY	4	145	0	0	0	0
4004/Anderson	DY	29	---[d]	1	12	1	12
4006/Bear Canyon	DW	27B	2,193	26	169	11	71.5
	OS	27B	433	16	88	7	38.5
	EW	RC	2,626	9	58.5	1	6.5
4007/Beaver Creek	DS	32-33	4,067	184	1,012	160	880
	ES	12	4,067	41	225.5	32	176
	MC	4	---[d]	---[d]	---[d]	---[d]	---[d]
	MY	4	4,067	1	12	1	12
4008/Bench	OY	27B	1,376	9[e]	108	8[e]	96
	AN	11	476	1	12	1	12
4009/Big Springs	DY	27B	1,198	1	12	1	12
	AN	11	1,198	4	48	2	24
4010/Blind Canyon	DW	27B	4,135	49	318.5	21	136.5
	EW	RC	4,135	14	91	1	6.5
	MY	4	2,407	1	12	0	0
4011/Box Flat	DY	29	26,285	29	348	29	348
	SE	NSR	24,712	170	2,040	0	0
4012/Brown	DY	29	172	0	0	0	0
4013/Buckmaster	DY	29	48,029	52	624	52	624
	SE	NSR	6,389	44	529	0	0
	AN	9	16,403	54	648	0	0
4014/Buckskin	DS	27B	4,636	169	929.5	73	401.5
	ES	RC	4,636	46	253	3	16.5
4016/Calf Canyon	DY	29	6,487	7	84	7	84
	SE	NSR	4,632	32	384	0	0
4017/Canal Cattle	DY	27B	463	1	12	0	0
4018/Canyon	DY	32-33	721	5	60	4	48
	DW	32-33	1,656	137	890.5	119	773.5
4019/Cat Canyon	DY	29	1,984	2	24	2	24
	AN	11	1,984	7	84	3	36
4022/Chimney Rock Flat	AN	11	26,910	88	1,056	42	504
	OY	29	46,606	51	612	51	612
4023/Church Flat	DY	29	8,426	9	108	9	108
	AN	11	5,755	19	228	9	108
4024/Clarks Valley	DY	27B	9,377	10	120	4	48
	AN	11	7,996	26	312	12	144
4025/Cleveland Summer	AN	11	10,945	36	432	17	204
	DY	29	13,343	14	168	14	168
	OM	29	25,830	51	612	51	612
4026/Cleveland Winter	AN	11	7,230	24	288	11	132
	OY	29	7,230	8	96	8	96
4129/Closed to Grazing	DY	29	---[d]	---[d]	---[d]	---[d]	---[d]
4027/Coal Creek	DC	27B	13,204	1,758[e]	11,427	1,530[e]	9,945
	DW	27B	---[d]	---[d]	---[d]	---[d]	---[d]
	DY	27B	445	0	0	0	0
	AN	11	445	1	12	1	12
	EW	22	8,975	31	201.5	15	97.5
4020/Columbia	DW	27B	1,592	19	123.5	8	52
	OY	27B	1,481	2	24	1	12

Allotment/Pasture	Species Symbol[a]	Herd Unit	Acres Surveyed[b]	Population Estimates[c] and Forage Demand: Prior Stable Numbers	Prior Stable Forage Demand	Present Numbers	Present Forage Demand
4028/Consumers Wash	OW	32-33	---[d]	---[d]	---[d]	---[d]	---[d]
	OC	32-33	7,377	610	3,965	531	3,451.5
	EW	12	4,218	14	91	12	78
	MY	4	2,665	1	12	0	0
4029/Coon Spring	AN	11	7,403	24	288	12	144
	OY	29	7,403	8	96	8	96
4030/Corner	OW	27B	1,179	96[e]	624	85[e]	552.5
	OC	27B	1,488	198[e]	1,287	172[e]	1,118
	EW	22	1,338	5	32.5	2	13
4031/Cove	AN	11	15,279	50	600	24	288
	OY	27B	10,675	12	144	5	60
	OC	27B	48	2	13	1	6.5
4032/Cow Canyon	OS	27B	7,180	262	1,441	113	621.5
	ES	RC	2,793	28	154	2	11
	EW	RC	3,992	14	91	1	6.5
4033/Crandall Canyon	OS	32-33	4,524	205	1,127.5	178	979
	OW	32-33	327	27	175.5	24	156
	ES	12	1,685	17	93.5	13	71.5
	EC	12	5,091	174	1,131	139	903.5
	MY	4	7,108	2	24	0	0
	EW	12	327	1	6.5	1	6.5
4035/Deadman	OS	278	1,443	65[e]	357.5	57[e]	313.5
	OW	278	1,142	94[e]	611	82[e]	533
	MY	4	2,630	1	12	0	0
	EW	22	2,630	9	58.5	5	32.5
4037/Dripping Spring	AN	11	4,795	16	192	7	84
	OY	29	10,419	11	132	11	132
	OM	29	4,952	10	120	10	120
4038/Dry Canyon	OW	278	9,163	108	702	46	299
	OS	27B	11,250	410	2,255	177	973.5
	EW	RC	13,365	46	299	3	19.5
	ES	RC	6,328	63	346.5	4	22
4039/Dugout	OW	27B	1,322	16	104	7	32.5
	OS	27B	0	0	0	0	0
	EW	RC	1,322	5	32.5	0	0
	MY	4	0	0	0	0	0
4042/Elliot Mountain	OY	27B	69,858	77	924	33	396
	SE	EM	48,307	333	3,996	9	108
	AN	11	8,229	27	324	13	156
4041/Elmo	OY	29	1,968	2	24	2	24
	AN	11	1,968	6	72	3	36
4127/Erramouspe	OY	32-33	13	0	0	0	0
4043/Fan Canyon	OY	27B	1,100	1	12	0	0
	OW	27B	1,360	16	104	7	45.5
4044/Farnham	AN	11	6,755	22	264	11	132
	OY	29	6,755	7	84	7	84
4045/Fausett	OC	32-33	846	113	734.5	98	637
4046/Fish Creek	OC	32-33	---[d]	---[d]	---[d]	---[d]	---[d]
	OS	32-33	658	30	165	26	312
	ES	12	658	7	38.5	5	27.5
	MC	4	---[d]	---[d]	---[d]	---[d]	---[d]
	MY	4	445	0	0	0	0
4130/Gordon Creek Unallotted	OC	32-33	4,432	590	3,835	513	3,334.5
	OW	32-33	4,125	341	2,216.5	297	1,930.5
	DS	32-33	0	0	0	0	0
	EC	12	0	---[d]	---[d]	---[d]	---[d]
	EW	12	5,722	---[d]	---[d]	---[d]	---[d]
	ES	12	0	---[d]	---[d]	---[d]	---[d]
	MC	4	0	---[d]	---[d]	---[d]	---[d]
	MY	4	2,512	1	12	0	0
4048/Grassy Trail	AN	11	884	3	36	1	12
	OW	278	20	0	0	0	0
	OY	278	1,426	2	24	1	12

Allotment/Pasture	Species Symbol[a]	Herd Unit	Acres	Population Estimates[c] and Forage Demand			
				Prior Stable		Present	
			Surveyed[b]	Numbers	Forage Demand	Numbers	Forage Demand
4049/Green River North (Allotment Summary)	DW	27B	142,102	1,675	4,842.5	689	4,673.5
	DS	27B	33,699	1,412	7,766	606	3,333
	EW	RC	80,819	277	1,800.5	17	110.5
	ES	RC	26,786	267	1,468.5	17	93.5
	SR	RC	55,875	386	4,632	17	204
	DC	27B	7,77B	398	2,587	172	1,118
4049/Green River/01	DW	27B	41,806	493	3,204.5	212	1,378
	DC	27B	846	43	279.5	19	123.5
	EW	RC	13,936	48	312	3	19.5
	SR	RC	20,717	143	1,716	6	72
/02	DC	27B	5,886	302	1,963	130	845
	DW	27B	79,018	931	6,051.5	400	2,600
	SR	RC	22,134	153	1,836	7	84
	EW	RC	32,049	110	715	7	45.5
/03	DC	27B	515	26	169	11	71.5
	DW	27B	15,457	182	1,183	78	507
	EW	RC	23,946	82	533	5	32.5
	SR	RC	12,451	86	1,032	4	48
	DS	278	17,690	645	3,547.5	276	1,518
	ES	RC	10,607	106	583	7	38.5
/04	DC	27B	531	27	175.5	12	78
	DW	27B	5,821	69	448.5	29	188.5
	SR	RC	573	4	48	0	0
	EW	RC	10,888	37	240.5	2	13
	ES	RC	16,179	161	885.5	10	55
	DS	27B	21,009	767	4,218.5	330	1,815
4050/Green River South	DY	27B	22,649	25	300	11	132
4051/Haley Canyon	DC	32-33	3,091	412	2,678	358	2,327
	DW	32-33	428	35	227.5	31	201.5
	EW	12	2,369	8	52	6	39
	MY	4	428	0	0	0	0

Allotment/Pasture	Species Symbol[a]	Herd Unit	Acres	Population Estimates[c] and Forage Demand			
				Prior Stable		Present	
			Surveyed[b]	Numbers	Forage Demand	Numbers	Forage Demand
4052/Hiawatha	DC	32-33	2,467	328	2,132	286	1,859
	DW	32-33	1,727	143	929.5	124	806
	EW	12	1,527	5	32.5	4	26
	MY	4	643	0	0	0	0
	DS	32-33	579	26	143	23	126.5
	EC	12	131	5	32.5	4	26
4053/Hayes Wash	AN	11	2,093	7[e]	84	3[e]	36
	DC	27B	1,874	250[e]	1,625	217[e]	1,410.5
	DW	27B	938	77[e]	500.5	67[e]	435.5
	DY	27B	2,564	17[e]	204	15[e]	180
4054/Huff Bench	DM	29	5,412	11	132	11	132
4055/Humbug	DM	29	17,845	35	420	35	420
	DY	29	25,321	26	312	26	312
	AN	11	21,230	70	840	33	396
4056/Icelander	AN	11	45,853	150	1,800	71	852
	DW	278	7,495	88	572	38	247
	DY	27B & 29	47,402	52	624	52	624
4057/Iriart	DW	27B	1,784	21	136.5	9	58.5
	DS	27B	0	0	0	0	0
	EW	22	1,784	6	39	3	19.5
	MY	4	1,784	1	12	0	0
4058/Jensen	DY	29	168	0	0	0	0
4059/Johnson Huff Hollow	DM	29	5,058	10	120	10	120
4060/Keel	DW	27B	1,334	16	104	7	45.5
	MY	4	452	0	0	0	0
	EW	RC	1,334	5	32.5	0	0
4061/Kimball Canyon	DW	27B	1,453	17	110.5	7	45.5
	EW	22	1,453	5	32.5	2	13
	MY	4	1,453	0	0	0	0

			Acres	Population Estimates[c] and Forage Demand			
				Prior Stable		Present	
Allotment/Pasture	Species Symbol[a]	Herd Unit	Surveyed[b]	Numbers	Forage Demand	Numbers	Forage Demand
4128/Kyune I	DS	32-33	15,117	685	3,767.5	596	3,278
	DW	32-33	7,535	623	4,049.5	542	3,523
	ES	22	10,165	102	561	51	280.5
	EW	22	5,997	21	136.5	10	65
	MC	4	---[d]	---[d]	---[d]	---[d]	---[d]
	MY	4	24,019	7	84	1	12
4062/Kyune II	DW	32-33	4,283	354	2,301	308	2,002
	DS	32-33	4,975	226	1,243	196	1,078
	ES	22	3,045	30	165	15	82.5
	EW	22	7,093	24	154	12	78
	MY	4	10,138	3	36	1	12
4063/Last Chance	DW	27B	19,839	234	1,521	101	656.5
	DC	27B	23,117	1,185	7,702.5	510	3,315
	EW	RC	5,202	18	117	1	6.5
	SE	RC	---[d]	---[d]	---[d]	---[d]	---[d]
	SR	RC	44,003	303	3,636	24	288
4065/Lila Canyon	DW	27B	2,227	26	169	11	71.5
	EW	RC	2,227	8	52	0	0
4066/Little Park	DC	27B	14,969	767	4,985.5	330	2,145
	DW	27B	4,495	53	344.5	23	149.5
	DS	27B	1,321	48	264	21	115.5
	EW	RC	19,426	67	435.5	4	26
4067/Long Bench	DS	32-33	275	12	66	11	60.5
	DW	32-33	282	23	149.5	20	130
	EW	12	557	2	13	2	13
	MY	4	557	0	0	0	0
4068/Lookoff	DM	29	4,508	9	108	9	108
4069/Lucky Lemon Flat	DM	29	9,004	18	216	18	216
	DY	29	954	1	12	1	12
4070/Marakis	DS	32-33	199	9	49.5	8	44
	EW	12	16	0	0	0	0
	MC	4	---[d]	0	0	0	0
	MY	4	199	0	0	0	0
	ES	12	183	2	11	1	5.5
4071/Marsing	DY	29	805	1	12	1	12
4072/Mathis Wash	DY	29	4,085	4	48	4	48
	AN	11	2,366	8	96	4	48
4073/Max Canyon	DW	27B	370	4	26	2	13
4074/Miller Creek	DY	29	---[d]	---[d]	---[d]	---[d]	---[d]
	DY	32-33	7,273	50	600	43	516
	DW	32-33	293	24	156	21	136.5
4075/Mohrland	DS	32-33	563	26	143	22	121
	DW	32-33	3,184	263	1,709.5	229	1,488.5
	EW	12	1,121	4	26	3	19.5
	MY	4	592	0	0	0	0
4076/Mounds	DY	29	3,618	4	48	4	48
	AN	11	3,618	12	144	6	72
4077/Mud Springs	DC	27B	5,860	300	1,950	129	838.5
	DW	27B	5,370	63	409.5	27	175.5
	DY	27B	10,209	11	132	5	60
	DY	29	5,541	6	72	6	72
	AN	11	16,135	53	636	25	300
	EW	RC	250	1	6.5	0	0
4078/Mudwater	DS	32-33	731	33	181.5	29	159.5
	EC	12	731	25	162.5	20	130
	MY	4	394	0	0	0	0
4079/North Clarks Valley	AN	11	472	2	24	1	12
	DY	27B	7,422	8	96	4	48
	DW	27B	4,574	54	351	23	149.5
	DC	27B	2,768	142	923	61	396.5
4080/North Hollow	DW	27B	815	10	65	4	26
	EW	22	815	3	19.5	1	6.5
	MY	4	815	0	0	0	0
4081/North Olsen Lake	AN	11	1,385	5	60	2	24
	DY	29	3,450	4	48	4	48

			Acres	Population Estimates[c] and Forage Demand			
				Prior Stable		Present	
Allotment/Pasture	Species Symbol[a]	Herd Unit	Surveyed[b]	Numbers	Forage Demand	Numbers	Forage Demand
4082/North Spring	DC	32-33	7,198	958	6,227	834	5,421
	EW	12	1,625	6	39	4	26
4083/Oil Well Draw	AN	11	12,383	41	492	19	228
	DY	29	12,383	13	156	13	156
	DY	27B	---[d]	---[d]	---[d]	---[d]	---[d]
4084/Oviatt	DY	29	455	1	12	1	12
4085/Pace Canyon	DW	27B	773	9	58.5	4	26
	DS	27B	2,138	78	429	34	187
	EW	RC	2,911	10	65	1	6.5
	ES	RC	0	0	0	0	0
4087/Patmos	DS	27B	5,546	202	1,111	87	478.5
	EW	RC	1,948	7	45.5	0	0
	ES	RC	3,598	36	198	2	11
4088/Peterson	OY	29	---[d]	0	0	0	0
4089/Pine Canyon	DS	27B	724	26	143	11	60.5
	EW	RC	2,269	8	52	1	6.5
	DW	27B	1,545	18	117	8	52
4090/Pinnacle Bench	DC	32-33	2,002	267	1,735.5	231	1,501.5
4091/Poison Spring Bench	DW	32-33	5,701	771	5,011.5	410	2,665
	DY	32-33	6,056	41	492	36	432
4092/Pole Canyon	OS	27B	3,405	124	682	53	291.5
	ES	RC	105	1	5.5	0	0
	EW	RC	3,194	11	71.5	1	6.5
4093/Porphyry Bench	DC	32-33	8,409	1,120	7,280	974	6,331
	EW	12	385	1	6.5	1	6.5
4086/Price Canyon East	DS	32-33	4,638	210	1,155	188	1,034
	DW	32-33	2,192	181	1,176.5	158	1,027
	ES	22	2,841	28	154	23	126.5
	EW	22	3,962	14	91	11	71.5
	MY	4	---[d]	---[d]	---[d]	---[d]	---[d]
4094/Price Canyon West	DS	32-33	4,642	210	1,155	183	1,006.5
	DW	32-33	1,564	129	838.5	113	734.5
	ES	12	2,215	22	121	18	99
	EW	12	3,769	13	84.5	10	65
	MC	4	861	19	228	4	48
	MY	4	5,415	2	24	0	0
4095/Price River North	AN	11	809	3	36	1	12
	DY	29	809	1	12	1	12
4125/Price River South	DY	27B	3,539	42	504	18	216
	SE	EM	3,539	24	288	1	12
4096/Range Creek (Allotment Summary)	DS	27B	22,817	832	4,576	358	1,969
	DW	27B	20,519	242	1,573	104	676
	DC	27B	6,619	339	2,203.5	146	949
	ES	RC	2,487	24	132	2	11
	EW	RC	48,310	166	1,079	11	71.5
	SR	RC	---[d]	---[d]	---[d]	---[d]	---[d]
	SE	RC	---[d]	---[d]	---[d]	---[d]	---[d]
4096/Range Creek/01	DS	27B	17,515	639	3,514.5	275	1,512.5
	DW	27B	9,559	113	734.5	48	312
	DC	27B	57	3	19.5	1	6.5
	ES	RC	1,730	17	93.5	1	5.5
	EW	RC	26,481	91	591.5	6	39
	SR	RC	---[d]	---[d]	---[d]	---[d]	---[d]
	SE	EM	---[d]	---[d]	---[d]	---[d]	---[d]
/02	DS	27B	5,302	193	1,061.5	83	456.5
	DW	27B	10,960	129	838.5	56	364
	DC	27B	6,562	336	2,184	145	942.5
	ES	12	757	7	38.5	1	5.5
	EW	12	21,829	75	487.5	5	32.5
	SR	RC	---[d]	---[d]	---[d]	---[d]	---[d]
	SE	RC	---[d]	---[d]	---[d]	---[d]	---[d]
4097/Range Mountain	DS	27B	2,931	107	588.5	46	253
	ES	RC	2,931	29	159.5	2	11
	SR	RC	134	1	12	0	0

			Acres	Population Estimates[c] and Forage Demand			
				Prior Stable		Present	
Allotment/Pasture	Species Symbol[a]	Herd Unit	Surveyed[b]	Numbers	Forage Demand	Numbers	Forage Demand
4098/Rimrock	DS	278	1,131[d]	41[d]	225.5[d]	18[d]	99
	EW	RC	---	---	---	---	---[d]
	EW	22	1,131[d]	4[d]	26	2[d]	13
	MY	4	---	---	---[d]	---	---[d]
4099/River	OW	27B	13,307	157	1,020.5	67	435.5
	SE	RC	13,307	92	1,104	3	36
4100/Rock Canyon	OW	27B	1,583	19	123.5	8	52
	EW	RC	1,583	5	32.5	0	0
4101/Rock Creek (Allotment Summary)	DC	278	28,424	1,456	9,464	627	4,075.5
	OW	27B	23,284	275	1,787.5	118	767
	OS	27B	24,396	890	4,895	383	2,106.5
	EW	RC	60,406	206	1,339	13	84.5
	ES	RC	12,040	114	627	7	38.5
	SR	RC	67,016	462	5,544	20	240
/01	OC	27B	17,915	918	5,967	395	2,567.5
	OW	27B	11,673	138	897	59	383.5
	OS	278	13,734	501	2,755.5	216	1,188
	EW	RC	38,384	131	851.5	8	52
	ES	RC	3,809	32	176	2	11
	SR	RC	40,294	278	3,336	12	144
/02	OC	27B	10,509	538	3,497	232	1,508
	OW	27B	11,611	137	890	59	383.5
	DS	27B	10,662	389	2,139.5	167	918.5
	EW	RC	22,022	75	487.5	5	32.5
	ES	RC	8,231	82	451	5	27.5
	SR	RC	26,722	184	2,208	8	96
4102/Sage Flat	OM	29	5,490[d]	11[d]	132	11[d]	132
	OY	29	---	---	---[d]	---	---[d]
4103/Sheep Canyon	OS	27B	10,830	395	2,172.5	170	935
	OW	27B	4,775	56	364	24	156
	ES	RC	7,707	77	423.5	5	27.5
	EW	RC	8,453	29	188.5	2	13
4104/Smith	OY	32-33	1,360[d]	9[d]	108	8[d]	96
	DY	29	---	---	---[d]	---	---[d]
4105/Soldier Canyon	OC	27B	10,374	1,381	8,976.5	1,202	7,813
	DW	27B	6,930	573	3,724.5	499	3,243.5
	DY	27B	3,567	24	288	21	252
	AN	11	5,740	19	228	9	108
4106/South Olsen Lake	AN	11	1,586	5	60	2	24
	OY	29	1,746	2	24	2	24
4107/Spring Canyon	EC	12	1,692	58	377	46	299
	EW	12	1,893	6	39	5	32.5
	ES	12	3,695	37	203.5	29	159.5
	DS	32-33	7,208	327	1,798.5	284	1,562
	MY	4	7,638	2	24	0	0
4108/Staker	OY	29	677	1	12	1	12
4109/Stone Cabin	OS	27B	5,052	184	1,012	79	434.5
	OW	27B	25,205	297	1,930.5	128	832
	ES	RC	2,249	22	121	1	5.5
	EW	RC	27,998	96	624	6	39
	MY	4	1,103	0	0	0	0
4111/Sulfur Canyon	OS	27B	5,168	189	1,039.5	81	445.5
	DW	27B	5,178	61	396.5	26	169
	ES	22	4,928	49	269.5	25	137.5
	EW	22	4,823[d]	17	110.5	8	52
	MY	4	---	0	0	0	0
4110/Summerville	AN	11	17,554	58	696	27	324
	DM	29	12,901	14	168	14	168
	DY	29	18,780	37	444	37	444
4112/Trail Canyon	OS	32-33	4,488	203	1,116.5	177	973.5
	OW	32-33	496	41	266.5	36	234
	EC	12	3,726	127	825.5	102	663
	ES	12	300	3	16.5	2	11
	EW	12	884	3	19.5	2	13
	MY	4	4,912	1	12	0	0

Allotment/Pasture	Species Symbol[a]	Herd Unit	Acres Surveyed[b]	Population Estimates[c] and Forage Demand: Prior Stable Numbers	Prior Stable Forage Demand	Present Numbers	Present Forage Demand
4113/Trail Spring	AN	11	11,859	39	468	18	216
	DY	29	26,956	29	348	29	348
4114/Victor	AN	11	4,327	14	168	7	84
	DY	29	4,327	5	60	5	60
4115/Washboard	DY	29	10,657	12	144	12	144
	DW	32-33	141[d]	12[d]	78[d]	10[d]	65[d]
	DY	32-33	---	---	---	---	---
4118/Wattis	DS	32-33	2,428	110	605	96	528
	DC	32-33	1,149	153	994.5	133	864.5
	DW	32-33	1,106	91	591.5	80	520
	EC	12	2,400	82	533	66	429
	EW	12	2,854	10	65	8	52
	MY	4	4,105	1	12	0	0
4119/Wellington	DY	29	1,538	2	24	2	24
4121/Wildcat	DS	32-33	1,712	78	429	68	374
	EW	12	1,760	6	39	5	32.5
	MY	4	1,760	1	12	0	0
	DW	32-33	48	4	26	3	19.5
4122/Willow Creek	ES	22	2,703	27	148.5	22	121
	EW	22	7,257	25	162.5	12	78
	DS	27B	6,222	227	1,248.5	98	539
	DW	27B	3,662	43	279.5	19	123.5
	MY	4	11,193	3	36	1	12
4123/Woodhill	DY	27B	---[d]	---[d]	---[d]	---[d]	---[d]
	DW	27B	4,080	337[e]	2,190.5	294[e]	1,911
	EW	22	341	1	6.5	1	6.5
	MY	4	341	0[f]	0	0[f]	0
	DC	27B	41	5	32.5	5	32.5
4124/Woodside	DC	27B	3,662	188	1,222	81	526.5
	DW	27B	13,101	154	1,001	66	429
	AN	11	5,641	18	216	9	108
	SE	RC	10,907	75	900	2	24
	DY	27B	15,345[d]	17[d]	204[d]	7[d]	84[d]
	DY	29	---	---	---	---	---
	SR	RC	5,565	38	456	2	24

[a] Species Symbol (Use Period)

DC - Deer Critical Winter (11-1/5-15)	DW - Deer Winter (11-1/5-15)
DS - Deer Summer (5-16/10-31)	DY - Deer Yearlong
DM - Deer Moderate Priority Yearlong	EC - Elk Critical Winter (11-1/5-15)
EW - Elk Winter (11-1/5-15)	ES - Elk Summer (5-15/10-31)
MY - Moose Yearlong	MC - Moose Critical Yearlong
SE - Desert Bighorn Sheep Yearlong	SR - Rocky Mountain Bighorn Sheep Yearlong
AN - Antelope Yearlong	

[b] Surveyed - Acres Entered on SVIM Computer Allotment File Allocation Module

[c] Population Estimates - Numbers of animals calculated from seasonal use acreages and the following table showing acres/animal for species, season of use, and herd unit (methods used to calculate acres/animal are described in Appendix 5).

			Prior Stable	Current
Mule Deer	27B	DC	19.51	45.36
		DW	84.86	197.39
		DS	27.406	63.73
		DY	904.46	2,108.0
	32-33	DC	7.51	8.63
		DW	12.09	13.90
		DS	22.06	25.36
		DY	146.65	168.50
	29	DM	506.88	506.88
		DY	920.93	920.93
Elk	12	EC	29.27	36.59
		EW	292.0	365.0
		ES	100.47	125.59
	22	EW	292.0	584.0
		ES	100.47	200.94
	RC	EW	292.0	4,672.0
		ES	100.47	1,607.5
Moose	4	MY	3,500.0	17,131.57
		MC	45.0	220.26
Antelope	11	AN	305.0	643.72
Desert Bighorn		Elliot Mountain	145.0	5,104.0
		San Rafael	145.0	0
Rocky Mountain Bighorn		Range Creek	145.0	3,252.83

[d] Data unavailable

[e] Calculated using Herd Unit 32-33 seasonal

APPENDIX 7

Methodology for Determining Economic Impacts

As a result of a 1979 interagency agreement between the Economic Statistics and Cooperative Service (ESCS), U. S. Forest Service (USFS), and the Bureau of Land Management (BLM), ESCS collected rancher economic data for the USFS and BLM.

Producers using BLM forage in the EIS area were stratified according to herd size, season of Federal rangeland use, and dependency on Federal lands for grazing. Average cost and returns for producers in these strata were first based upon U. S. Department of Agriculture cost of production survey data for a broad geographic area including the EIS area. To reflect local conditions, the survey data were adjusted through local producers' panels, extension specialists, lending institutions, and universities. The final ranch budgets for the EIS are shown in Tables 1 through 6.

Based upon these ranch budgets, a linear programming model was developed for each rancher strata. Models were set up to maximize net income based on a series of production parameters and constraints. The amount of grazing on public lands enters the model at a constrained level equal to that used by each of the typical ranches. The BLM forage constraints were then varied to see how the typical profit-maximizing ranches would adjust to these changes. Average costs, returns, herd size, and hired labor requirements were then computed by rancher strata for 10 through 30 percent increases in available public forage, and 10 through 100 percent decreases in available public forage. The results of this modeling are shown in Tables 7 through 18.

Operators in the EIS area were then grouped into the same strata used in the linear programming models. Each ranch has a unique set of characteristics affecting its operation which cannot be fully represented by a ranch model. However, the ranch models can be used to estimate the aggregate impacts of changing the allocation of public land forage to those ranches in each strata.

Impacts were estimated assuming those ranches not using their full active preference, would continue at their 5-year average licensed use. Therefore, only when the proposed level of use was below an operator's 5-year average was a negative impact recorded. It was also assumed that the forage allocation made available in each alternative would be fully utilized. These assumptions tend to overestimate the rancher benefits of each alternative.

The changes in forage allocation were evaluated by assuming the changes were uniform throughout the existing period of use. Changes in season of use constrain the periods that operators can use public forage. These changes were not evaluated by ESCS or through linear program modeling. The proposed changes in season of use most consistently exclude grazing during

COSTS AND RETURNS FOR BEEF HERDS, BLM PRICE RIVER EIS AREA

Table 1
Beef Herds of 0-99 Cows
Spring, Summer, Fall Grazing

Item	Unit	Number	Average weight	Price Cwt	Total Value
Sales:					
Steer calves	Head	13	385	86.13	4,311
Heifer calves	Head	8	375	77.49	2,325
Yearling steers	Head	2	660	72.58	958
Yearling heifers	Head	2	640	65.47	838
Cull cows	Head	5	850	43.22	1,837
Total					10,269
Total/cow					250.46

	Total Value	Value/Cow
Cash costs:		
BLM grazing fee	434	10.59
Forest grazing fee	--	--
Private range lease/rent	719	17.54
State lease	55	1.35
Hay (produce)	1,376	33.56
Hay (purchase)	--	--
Protein supplement	583	14.22
Irrigated pasture	--	--
Salt and mineral	57	1.40
Concentrate feeds	--	--
Veterinary and medicine	174	4.24
Hired trucking	157	3.83
Marketing	152	3.71
Fuel and lubricants	1,227	29.93
Repairs	1,034	25.22
Taxes	1,054	25.71
Insurance	283	6.91
Interest on operating capital	433	10.56
General farm overhead	468	11.41
Other cash costs	--	--
Hired labor	39	.96
Total cash costs	8,245	201.10
Other costs:		
Family labor	1,838	44.82
Depreciation	2,252	54.94
Interest on investment other than land	4,949	120.70
Interest on land	14,880	362.93
Total other costs	23,919	583.39
Total all costs	32,164	784.49
Return above cash costs	2,024	49.37
Return above cash costs and family labor	186	4.54
Return to total investment	-2,066	-50.39
Return to land	-7,015	-171.10

Average herd 41 cows, 85% calf crop based on Jan. 1 bred cow inventory with preg. test, 9% calf loss birth to weaning, 4% annual cow loss, 12% replacement rate, 25 cows per bull, cattle and purchased hay prices 1978-80 three year averages, all other costs 1980, percent forage dependency Price River EIS Area 35%, deeded range 27%. state land 4%, range lease 12%, crop residue 2%, hay 18%, protein supplement 2%, real estate valued on an AU basis.

Table 2
Beef Herds of 0-99 Cows
Winter Grazing

Item	Unit	Number	Average weight	Price Cwt	Total Value
Sales:					
Steer calves	Head	14	385	86.13	4,642
Heifer calves	Head	10	365	77.49	2,828
Yearling steers	Head	--	--	--	--
Yearling heifers	Head	1	640	65.47	419
Cull cows	Head	3	850	43.22	1,102
Total					8,991
Total/cow					236.61

	Total Value	Value/Cow
Cash costs:		
BLM grazing fee	295	7.76
Forest grazing fee	48	1.27
Private range lease/rent	958	25.21
State lease	74	1.94
Hay (produce)	688	18.11
Hay (purchase)	--	--
Protein supplement	356	9.36
Irrigated pasture	--	--
Salt and mineral	53	1.40
Concentrate feeds	--	--
Veterinary and medicine	161	4.24
Hired trucking	146	3.84
Marketing	141	3.71
Fuel and lubricants	1,138	29.94
Repairs	998	26.25
Taxes	913	24.03
Insurance	264	6.94
Interest on operating capital	343	9.04
General farm overhead	434	11.42
Other cash costs	--	--
Hired labor	36	.95
Total cash costs	7,046	185.42
Other costs:		
Family labor	1,704	44.83
Depreciation	2,311	60.82
Interest on investment other than land	4,678	123.11
Interest on land	12,624	332.20
Total other costs	21,317	560.97
Total all costs	28,363	746.39
Return above cash costs	1,945	51.15
Return above cash costs and family labor	241	6.34
Return to total investment	-2,070	-54.47
Return to land	-6,748	-177.58

Average herd 38 cows, 85% calf crop based on Jan. 1 bred cow inventory with preg. test. 9% calf loss birth to weaning, 4% annual cow loss, 12% replacement rate, 25 cows per bull, cattle and purchased hay prices 1978-80 three year averages, all other costs 1980, percent forage dependency Price River EIS Area 21%, National Forest 3%. deeded range 40%, state land 6%, range lease 18%, crop residue 1%. hay 10%, protein supplement 1%. real estate valued on an AU basis.

COSTS AND RETURNS FOR BEEF HERDS, BLM PRICE RIVER EIS AREA

Table 3
Beef Herds of 100-299 Cows
Spring, Summer, Fall Grazing

Item	Unit	Number	Average weight	Price Cwt	Total Value
Sales:					
Steer calves	Head	55	385	86.13	18,238
Heifer calves	Head	34	375	77.49	9,880
Yearling steers	Head	6	660	72.58	2,874
Yearling heifers	Head	6	640	65.47	2,514
Cull cows	Head	7	850	43.22	2,572
Total					36,078
Total/cow					219.99

	Total Value	Value/Cow
Cash costs:		
BLM grazing fee	1,071	6.53
Forest grazing fee	--	--
Private range lease/rent	4,769	29.08
State lease	366	2.23
Hay (produce)	2,258	13.77
Hay (purchase)	--	--
Protein supplement	1,166	7.11
Irrigated pasture	--	--
Salt and mineral	230	1.40
Concentrate feeds	--	--
Veterinary and medicine	812	4.95
Hired trucking	279	1.70
Marketing	353	2.15
Fuel and lubricants	3,689	22.49
Repairs	3,648	22.24
Taxes	3,537	21.56
Insurance	1,059	6.46
Interest on operating capital	1,381	8.42
General farm overhead	1,648	10.05
Other cash costs	--	--
Hired labor	2,188	13.34
Total cash costs	28,454	173.50
Other costs:		
Family labor	4,248	25.90
Depreciation	8,642	52.69
Interest on investment other than land	19,100	116.46
Interest on land	49,195	299.97
Total other costs	81,185	495.03
Total all costs	109,639	668.53
Return above cash costs	7,624	46.49
Return above cash costs and family labor	3,376	20.59
Return to total investment	-5,266	-32.11
Return to land	-24,366	-148.57

Average herd 164 cows, 82% calf crop based on Jan. 1 bred cow inventory with preg. test, 9% calf loss birth to weaning, 6% annual cow loss, 13% replacement rate, 25 cows per bull, cattle and purchased hay prices 1978-80 three year averages, all other costs 1980, percent forage dependency Price River EIS Area 22%, National Forest 41%, state land 7%, range lease 20%, crop residue 1%. hay 8%, protein supplement 1%, real estate valued on an AU basis.

Table 4
Beef Herds of 100-299 Cows
Yearlong Grazing

Item	Unit	Number	Average weight	Price Cwt	Total Value
Sales:					
Steer calves	Head	58	385	86.13	19,233
Heifer calves	Head	36	375	77.49	10,461
Yearling steers	Head	7	660	72.58	3,353
Yearling heifers	Head	7	640	65.47	2,933
Cull cows	Head	10	850	43.22	3,674
Total					39,654
Total/cow					226.59

	Total Value	Value/Cow
Cash costs:		
BLM grazing fee	3,026	17.29
Forest grazing fee	328	1.87
Private range lease/rent	1,284	7.34
State lease	227	1.30
Hay (produce)	2,646	15.12
Hay (purchase)	--	--
Protein supplement	1,458	8.33
Irrigated pasture	--	--
Salt and mineral	245	1.40
Concentrate feeds	--	--
Veterinary and medicine	866	4.95
Hired trucking	298	1.70
Marketing	377	2.15
Fuel and lubricants	3,883	22.19
Repairs	3,847	21.98
Taxes	4,388	25.07
Insurance	1,121	6.41
Interest on operating capital	1,440	8.23
General farm overhead	1,759	10.05
Other cash costs	--	--
Hired labor	2,335	13.34
Total cash costs	29,528	168.73
Other costs:		
Family labor	4,532	25.90
Depreciation	8,960	51.20
Interest on investment other than land	20,199	115.42
Interest on land	62,640	357.94
Total other costs	96,331	550.46
Total all costs	125,859	719.19
Return above cash costs	10,126	57.86
Return above cash costs and family labor	5,594	31.97
Return to total investment	-3,366	-19.23
Return to land	-23,565	-134.66

Average herd 175 cows, 82% calf crop based on Jan. 1 bred cow inventory with preg. test, 9% calf loss birth to weaning, 6% annual cow loss, 13% replacement rate, 25 cows per bull, cattle and purchased hay prices 1978-80 three year averages, all other costs 1980, percent forage dependency Price River EIS Area 55%, National Forest 5%, deeded range 21%, state land 4%, range lease 5%, crop residue 1%, hay 8%, protein supplement 1%, real estate valued on an AU basis.

COSTS AND RETURNS FOR BEEF AND SHEEP HERDS, BLM PRICE RIVER EIS AREA

Table 5
Beef Herds of 300+ Cows

Item	Unit	Number	Average weight	Price Cwt	Total Value
Sales:					
Steer calves	Head	257	385	86.13	85,221
Heifer calves	Head	165	365	77.49	46,668
Yearling steers	Head	53	660	72.58	25,388
Yearling heifers	Head	55	670	65.47	24,126
Cull cows	Head	28	850	43.22	10,286
Total					191,689
Total/cow					222.38

	Total Value	Value/ Cow
Cash costs:		
BLM grazing fee	9,728	11.29
Forest grazing fee	--	--
Private range lease/rent	18,216	21.13
State lease	1,400	1.62
Hay (produce)	20,886	24.23
Hay (purchase)	--	--
Protein supplement	7,776	9.02
Irrigated pasture	--	--
Salt and mineral	1,207	1.40
Concentrate feeds	--	--
Veterinary and medicine	1,336	1.55
Hired trucking	1,595	1.85
Marketing	1,810	2.10
Fuel and lubricants	9,774	11.34
Repairs	12,521	14.53
Taxes	18,011	20.89
Insurance	5,344	6.20
Interest on operating capital	6,384	7.41
General farm overhead	6,655	7.72
Other cash costs	--	--
Hired labor	8,303	9.63
Total cash costs	130,946	151.91
Other costs:		
Family labor	18,476	21.43
Depreciation	43,338	50.28
Interest on investment other than land	94,196	109.28
Interest on land	259,096	300.58
Total other costs	415,106	481.56
Total all costs	546,052	633.47
Return above cash costs	60,743	70.47
Return above cash costs and family labor	42,267	49.03
Return to total investment	-1,071	-1.24
Return to land	-95,267	-110.52

Average herd 862 cows, 81% calf crop based on Jan. 1 bred cow inventory with preg. test, 11% calf loss birth to weaning, 2% annual cow loss, 16% replacement rate, 20 cows per bull, cattle and purchased hay prices 1978-80 three year averages, all other costs 1980, percent forage dependency Price River EIS Area 35%, deeded range 29%, state land 5%, range lease 15%, crop residue 2%, hay 13%, protein supplement 1%, real estate valued on an AU basis.

Table 6
Sheep Herds of All Sizes

Item	Unit	Quantity	Average Weight	Price	Total Value
Sales:					
Slaughter Lambs	Head	507	93	66.30	31,261
Feeder Lambs	Head	261	82	73.96	15,829
Ewes	Head	87	145	26.86	3,388
Wool	Lbs.	887	10	.88	7,806
Wool Incentive Payment	Dol.	7,806		.39	3,044
Unshorn Lamb Payment	Cwt.	666		1.43	952
Total					62,280
Total/Ewe					71.59

	Total Value	Value/ Head
Cash Costs:		
BLM permit	2,502	2.88
Forest permit	145	.17
State leased	143	.16
Irrigated pasture	--	--
Private range lease/rent	1,945	2.24
Hay (purchase)	--	--
Hay (produce)	2,861	3.29
Grain (purchase)	--	--
Protein supplement	1,186	1.36
Other feed	--	--
Salt & minerals	244	.28
Spray & dipping	18	.02
Vet. & medicine	313	.36
Marketing	87	.10
Trucking	2,122	2.44
Shearing & tagging	1,653	1.90
Utilities	548	.63
Lamb promotion	26	.03
Organizations	87	.10
Legal & acct.	330	.38
Wool storage	70	.08
Predator control	583	.67
Ram death loss	513	.59
Fuel & lubricants	1,548	1.78
Repairs	1,544	1.78
Hired labor	3,018	3.47
Taxes	3,110	3.57
Insurance	504	.58
General farm overhead	1,035	1.19
Interest on oper. capital	1,419	1.63
Total Cash Costs	27,554	31.67
Other Costs:		
Family labor	3,018	3.47
Depreciation	6,578	7.56
Interest on investment other than land	11,738	13.49
Interest on land investment	45,149	51.90
Total Other Costs	66,483	76.42
Total All Costs	94,037	108.09
Return above cash costs	34,726	39.91
Return above cash costs & family labor	31,708	36.45
Return to total investment	25,130	28.89
Return to land investment	13,392	15.39

Average herd 870 ewes, 92% docking rate, 4% lamb loss docking to market, 7% annual ewe loss, 17% replacement rate, 50 ewes per ram, cattle and purchased hay prices 1978-80 three year averages, all other costs 1980, percent forage dependency Price River EIS Area 50%, National Forest 2%, state lease 3%, private lease 9%, crop residue 8%, deeded range 18%, hay 10%, protein supplement 1%, real estate valued on an AU basis.

IMPACT ON LIVESTOCK BUSINESSES OF ADJUSTMENTS IN RANGELAND FORAGE SUPPLIES

Table 7

0-99 Cows, Average Herd Size 41
Spring, Summer, Fall Grazing, 1980

Item	No Change	Percent Increases		
		10	20	30
		Dollars		
Gross income	10,262	10,617	10,992	11,348
Total cash costs	8,175	8,323	8,480	8,629
Value of family labor	1,836	1,900	1,967	2,031
Depreciation	2,252	2,266	2,282	2,296
Interest on investment other than land	4,947	5,063	5,185	5,301
Return above cash costs	2,087	2,294	2,512	2,719
Return above cash costs & family labor	251	394	545	688
Return to total investment	-2,001	-1,872	-1,737	-1,608
Return to land	-6,948	-6,935	-6,922	-6,909
		Head		
Herd size	40.97	42.39	43.89	45.31
		Hours		
Family labor	562	581	602	621
Hired labor	12	12	13	13

Table 8

0-99 Cows, Average Herd Size 41
Spring, Summer, Fall Grazing, 1980

Item	Percent Reductions					
	10	20	30	40	50	100
			Dollars			
Gross income	9,906	9,531	9,175	8,800	8,445	6,105
Total cash costs	8,026	7,869	7,720	7,563	7,415	6,094
Value of family labor	1,773	1,706	1,642	1,575	1,511	1,093
Depreciation	2,237	2,222	2,207	2,192	2,177	2,082
Interest on investment other than land	4,831	4,709	4,593	4,471	4,355	3,593
Return above cash costs	1,880	1,662	1,455	1,237	1,030	11
Return above cash costs & family labor	107	-44	-187	-338	-481	-1,082
Return to total investment	-2,130	-2,266	-2,394	-2,530	-2,658	-3,164
Return to land	-6,961	-6,975	-6,987	-7,001	-7,013	-6,757
			Head			
Herd size	39.55	38.05	36.64	35.14	33.72	24.38
			Hours			
Family labor	542	522	502	482	462	334
Hired labor	12	11	11	10	10	7

IMPACT ON LIVESTOCK BUSINESSES OF ADJUSTMENTS IN RANGELAND FORAGE SUPPLIES

Table 9
0-99 Cows, Average Herd Size 38
Winter Grazing, 1980

Item	No Change	Percent Increases 10	20	30
		Dollars		
Gross income	8,991	9,183	9,360	9,552
Total cash costs	7,044	7,136	7,222	7,314
Value of family labor	1,703	1,740	1,773	1,810
Depreciation	2,311	2,320	2,328	2,337
Interest on investment other than land	4,678	4,243	4,804	4,870
Return above cash costs	1,947	2,047	2,138	2,238
Return above cash costs & family labor	244	307	365	428
Return to total investment	-2,067	-2,013	-1,963	-1,909
Return to land	-6,245	-6,756	-6,267	-6,779
		Head		
Herd size	38.00	38.81	39.56	40.37
		Hours		
Family labor	521	532	542	553
Hired labor	11	11	11	12

Table 10
0-99 Cows, Average Herd Size 38
Winter Grazing, 1980

Item	Percent Reductions 10	20	30	40	50	100
			Dollars			
Gross income	8,814	8,622	8,445	8,253	8,075	7,145
Total cash costs	6,959	6,867	6,782	6,689	6,604	6,157
Value of family labor	1,670	1,633	1,600	1,564	1,530	1,354
Depreciation	2,303	2,294	2,285	2,276	2,268	2,225
Interest on investment other than land	4,617	4,552	4,491	4,425	4,365	4,047
Return above cash costs	1,855	1,755	1,663	1,564	1,471	988
Return above cash costs & family labor	185	122	63	0	-59	-366
Return to total investment	-2,118	-2,172	-2,222	-2,276	-2,327	-2,591
Return to land	-6,735	-6,724	-6,213	-6,701	-6,692	-6,638
			Head			
Herd size	37.25	36.44	35.69	34.88	34.13	30.20
			Hours			
Family labor	511	500	489	478	468	414
Hired labor	11	11	10	10	10	9

IMPACT ON LIVESTOCK BUSINESSES OF ADJUSTMENTS IN RANGELAND FORAGE SUPPLIES

Table 11

100-299 Cows, Average Herd Size 164
Spring, Summer, Fall Grazing, 1980

Item	No Change	Percent Increases 10	20	30
		Dollars		
Gross income	36,080	36,879	37,696	38,495
Total cash costs	28,454	28,826	29,206	29,578
Value of family labor	4,248	4,342	4,438	4,532
Depreciation	8,642	8,675	8,708	8,740
Interest on investment other than land	19,101	19,394	19,694	19,987
Return above cash costs	7,626	8,053	8,490	8,917
Return above cash costs & family labor	3,378	3,711	4,052	4,385
Return to total investment	-5,264	-4,964	-4,656	-4,355
Return to land	-24,365	-24,358	-24,350	-24,342
		Head		
Herd size	164.01	167.64	171.36	174.99
		Hours		
Family labor	1,299	1,328	1,357	1,386
Hired labor	669	684	699	714

Table 12

100-299 Cows, Average Herd Size 164
Spring, Summer, Fall Grazing, 1980

Item	Percent Reductions 10	20	30	40	50	100
			Dollars			
Gross income	35,281	34,465	33,665	32,849	32,050	28,019
Total cash costs	28,081	27,701	27,329	26,948	26,576	24,698
Value of family labor	4,154	4,058	3,964	3,867	3,773	3,299
Depreciation	8,610	8,576	8,544	8,510	8,478	8,314
Interest on investment other than land	18,808	18,508	18,214	17,915	17,621	16,142
Return above cash costs	7,200	6,764	6,336	5,901	5,474	3,321
Return above cash costs & family labor	3,046	2,706	2,372	2,034	1,701	22
Return to total investment	-5,564	-5,870	-6,172	-6,476	-6,777	-8,292
Return to land	-24,372	-24,378	-24,386	-24,391	-24,398	-24,434
			Head			
Herd size	160.38	156.67	153.03	149.32	145.69	127.37
			Hours			
Family labor	1,270	1,241	1,212	1,183	1,154	1,009
Hired labor	654	639	624	609	594	520

IMPACT ON LIVESTOCK BUSINESSES OF ADJUSTMENTS IN RANGELAND FORAGE SUPPLIES

Table 13

100-299 Cows, Average Herd Size 175
Yearlong Grazing, 1980

Item	No Change	Percent Increases 10	20	30
		Dollars		
Gross income	39,654	41,661	43,669	45,692
Total cash costs	29,535	30,484	31,432	32,388
Value of family labor	4,533	4,762	4,991	5,223
Depreciation	8,960	9,034	9,109	9,184
Interest on investment other than land	20,201	20,918	21,634	22,356
Return above cash costs	10,119	11,177	12,237	13,304
Return above cash costs & family labor	5,586	6,415	7,246	8,081
Return to total investment	-3,374	-2,619	-1,863	-1,103
Return to land	-23,575	-23,537	-23,497	-23,459
		Head		
Herd size	175.00	183.86	192.72	201.65
		Hours		
Family labor	1,386	1,456	1,526	1,597
Hired labor	714	750	786	823

Table 14

100-299 Cows, Average Herd Size 175
Yearlong Grazing, 1980

Item	Percent Reductions 10	20	30	40	50	100
			Dollars			
Gross income	37,490	35,326	33,145	30,982	28,818	17,982
Total cash costs	28,538	27,540	26,535	25,537	24,540	19,544
Value of family labor	4,285	4,038	3,789	3,541	3,294	2,055
Depreciation	8,880	8,800	8,719	8,639	8,558	8,157
Interest on investment other than land	19,429	18,656	17,878	17,106	16,333	12,466
Return above cash costs	8,952	7,786	6,610	5,445	4,278	-1,562
Return above cash costs & family labor	4,667	3,748	2,821	1,904	984	-3,617
Return to total investment	-4,213	-5,052	-5,898	-6,735	-7,574	-11,774
Return to land	-23,642	-23,708	-23,776	-23,841	-23,907	-24,240
			Head			
Herd size	165.45	155.90	146.28	136.73	127.18	79.36
			Hours			
Family labor	1,310	1,235	1,159	1,083	1,007	629
Hired labor	675	636	597	558	519	324

IMPACT ON LIVESTOCK BUSINESSES OF ADJUSTMENTS IN RANGELAND FORAGE SUPPLIES

Table 15
300+ Cows, Average Herd Size 862
1980

Item	No Change	Percent Increases		
		10	20	30
		Dollars		
Gross income	191,694	198,346	204,998	211,666
Total cash costs	130,962	133,318	135,673	138,035
Value of family labor	18,472	19,113	19,754	20,397
Depreciation	43,338	43,651	43,965	44,279
Interest on investment other than land	94,195	96,577	98,959	101,346
Return above cash costs	60,732	65,028	69,325	73,631
Return above cash costs & family labor	42,260	45,915	49,571	53,234
Return to total investment	-1,078	2,264	5,606	8,955
Return to land	-95,273	-94,313	-93,353	-92,391
		Head		
Herd size	861.99	891.90	921.81	951.80
		Hours		
Family labor	5,650	5,846	6,042	6,239
Hired labor	2,539	2,627	2,715	2,804

Table 16
300+ Cows, Average Herd Size 862
1980

Item	Percent Reductions					
	10	20	30	40	50	100
			Dollars			
Gross income	185,042	178,391	171,722	165,071	158,419	125,143
Total cash costs	128,606	126,251	123,889	121,534	119,178	107,394
Value of family labor	17,831	17,190	16,548	15,907	15,266	12,059
Depreciation	43,025	42,711	42,397	42,084	41,770	40,203
Interest on investment other than land	91,814	89,432	87,044	84,662	82,281	70,366
Return above cash costs	56,436	52,140	47,833	43,537	39,241	17,749
Return above cash costs & family labor	38,605	34,950	31,285	27,630	23,975	5,690
Return to total investment	-4,420	-7,761	-11,112	-14,454	-17,795	-34,513
Return to land	-96,234	-97,193	-98,156	-99,116	-100,076	-104,879
			Head			
Herd size	832.08	802.17	772.18	742.27	712.36	562.73
			Hours			
Family labor	5,454	5,258	5,061	4,865	4,669	3,688
Hired labor	2,451	2,363	2,274	2,186	2,098	1,658

IMPACT ON LIVESTOCK BUSINESSES OF ADJUSTMENTS IN RANGELAND FORAGE SUPPLIES

Table 17
Sheep, Average Herd Size 870
1980

Item	No Change	Percent Increases		
		10	20	30
		Dollars		
Gross income	62,279	65,383	68,488	71,417
Total cash costs	27,556	28,487	29,419	30,313
Value of family labor	3,019	3,169	3,320	3,462
Depreciation	6,578	6,612	6,646	6,679
Interest on investment other than land	11,738	12,095	12,453	12,791
Return above cash costs	34,723	36,896	39,069	41,104
Return above cash costs & family labor	31,704	33,727	35,749	37,642
Return to total investment	25,126	27,115	29,103	30,963
Return to land	13,388	15,020	16,650	18,172
		Head		
Herd size	869.95	913.31	956.67	997.60
		Hours		
Family labor	923	969	1,015	1,058
Hired labor	923	969	1,015	1,058

Table 18
Sheep, Average Herd Size 870
1980

Item	Percent Reductions					
	10	20	30	40	50	100
			Dollars			
Gross income	59,175	56,071	52,967	49,863	46,759	29,014
Total cash costs	26,625	25,693	24,762	23,831	22,899	16,871
Value of family labor	2,868	2,718	2,567	2,417	2,266	1,406
Depreciation	6,544	6,510	6,475	6,441	6,407	6,211
Interest on investment other than land	11,380	11,022	10,664	10,306	9,948	7,903
Return above cash costs	32,550	30,378	28,205	26,032	23,860	12,143
Return above cash costs & family labor	29,682	27,660	25,638	23,615	21,594	10,737
Return to total investment	23,138	21,150	19,163	17,174	15,187	4,526
Return to land	11,758	10,128	8,499	6,868	5,239	-3,377
			Head			
Herd size	826.60	783.24	739.88	696.52	653.16	405.29
			Hours			
Family labor	877	831	785	739	693	430
Hired labor	877	831	785	739	693	430

some period in the spring (March to May). Spring is also the period when ranchers have the fewest alternative sources of forage.

The average licensed use excluded during the spring by each alternative was estimated for all operators. This figure was adjusted for each alternative according to the herd-size change predicted by the linear program model. To calculate the worst case impact of these changes, it was assumed that this forage loss would be replaced with alfalfa hay purchased at $75 per ton. It was further assumed that an AUM of public forage supplied to a typical herd combination during the spring would have to be replaced with 730 pounds of alfalfa hay.

Changes in hired labor requirements were computed using the predicted expenditure for hired labor and the average income for farm laborers in Carbon County.

Hunter participation rates were calculated using a constant wildlife population per hunter day ratio for deer, antelope, and elk. Hunter days were converted to visitor days and input into a regional input-output model using the sales per visitor day estimates shown in Table 19. Changes in wildlife populations were calculated by assuming available forage would be consumed.

TABLE 19

Estimated Sales Values

	Sales Values (1979 Dollars)				
Industry Section	Sheep Sales (AMs)	Cattle Sales (AMs)	Big Game (Visitor Day)	Small Game (Visitor Day)	Green River Boating (Total)
Agriculture	$6.00	$20.00	--	--	--
Auto repair-service	--	--	$ 3.68	$2.88	$ 5,700
Eating-Drinking	--	--	4.56	1.47	16,700
Other Retail	--	--	4.62	2.20	11,800
Lodging	--	--	1.45	1.55	20,300
Recreation Services	--	--	--	--	168,800
Other Services	--	--	6.52	--	6,100
Total	$6.00	$20.00	$20.83	$8.10	$229,400

Direct operator income changes were calculated using linear programming estimated returns above cash cost. Indirect and induced income changes were calculated using an input-output model for Carbon and Emery Counties. Returns above cash cost were not used to measure induced effects since induced impacts are determined by reportable income, which is less than returns above cash costs. Reportable income was measured from changes in livestock sales and the income to sales ratio in the input-output model.

Indirect and induced effects were therefore based on changes in sales resulting from each alternative. The sale values used in the input-output model are shown in Table 19.

Increases in sheep AMs in Alternatives A and B were not included in the regional economic impact. It was assumed that sheep use would continue at or near present average licensed use, and herds would not be expanded significantly to utilize available forage. Therefore, only the impact of reductions below average licensed use was included in the regional impact totals.

APPENDIX 8

Potential Big Game Transplants in the Price River Resource Area

The BLM, in cooperation with UDWR, has proposed several big game animal transplants in the Resource Area. These transplants were identified in MFP Step 1 and on the UDWR big game transplant priority list of February 9, 1982. The species, area, date, and priority of the transplants are shown below. As indicated on the table, cooperative aggreements between BLM and UDWR have already been signed for three of the potential transplants.

Species	Area	Proposed Date	Cooperative Agreement	Priority
Elk	Range Creek	1985-86	No	4
Antelope	Clarks Valley	1982-83	Yes	1
	Junction of highways U-10 and U-122	1985-86	No	5
	Buckmaster Allot.	1988-89	No	8
Desert Bighorn	San Rafael Reef	1982-83	Yes	2
	Elliot Mountain	1983-84	Yes	3
	Lower Nine Mile	1987-88	No	7
Rocky Mtn. Bighorn	Desolation Canyon	1986-87	No	6

GLOSSARY

ACRE-FOOT: The volume of material or water that will cover an area of 1 acre to a depth of 1 foot (43,560 cubic feet or 325,851 gallons).

ACTIVE PREFERENCE: That portion of the total preference for which grazing use may be authorized.

ACTIVITY PLAN: A management plan prepared for a specific land use activity such as grazing, wildlife, or recreation. An allotment management plan is an activity plan.

ACTUAL USE: The actual amount of livestock grazing as submitted by the livestock operator and confirmed by BLM's field checks.

AGE CLASS: A category of plants of similar age or of age-related periods.

ALLOTMENT: An area of land where one or more operators graze their livestock. It generally consists of public land but may include private or State land.

ALLOTMENT MANAGEMENT PLAN (AMP): A documented program of livestock grazing management prepared in consultation with the permittee(s) involved. It prescribes the manner and extent to which livestock operations will be conducted in order to meet management objectives on a specific allotment. It also describes the type, location, and ownership of range improvements to be installed on public lands.

ANIMAL MONTH (AM): The amount of forage required to sustain a specific animal species for one month. It differs from the animal unit month (AUM) in that it is not convertible to other species, and the deer AM, cow AM, and sheep AM etc. are not additive due to different diets.

BROWSE: The tender shoots, twigs, and leaves of trees and shrubs often used as forage by cattle, sheep, deer, elk, and other animals; to consume browse.

CATION: A positively charged ion.

CLIMAX COMMUNITY: The final vegetation community that emerges after a series of successive vegetation stages and perpetuates itself indefinitely unless disturbed by outside forces.

CRITICAL WINTER RANGE: That portion of the living area of a wildlife species that is essential to the survival and perpetuation of a population through the winter season.

DENSITY: The number of individual plants per unit of area. Refers to the relative closeness of plants to one another.

DIRECT EFFECT: Changes in sales, employment, or income of a firm that result directly from the firm's change in output.

ECOLOGICAL CONDITION: The relationship of the present vegetation to the range site description (natural potential) for that site. It is measured as a percentage of the present plant community that is climax for the range site.

ECOSYSTEM: A complex, self-sustaining natural system that includes living and nonliving components of the environment and the interactions that bind them together.

ENVIRONMENTAL ASSESSMENT (EA): The procedure for analyzing the impacts of a proposed action on the environment and the documentation of that analysis. An EA is similar to an environmental impact statement (EIS) except it is smaller in scope.

EVAPOTRANSPIRATION: The total water loss from the soil, including that by direct evaporation and that by transpiration from the surfaces of plants.

FORAGE: All browse and herbaceous foods available to grazing animals, under proper use, which may be grazed or harvested for feeding.

FORBS: An herbaceous plant that is not a grass, sedge, or rush.

HERBACEOUS: Pertaining to plants having little or no woody tissue.

HERD UNIT: A geographical area designated as a management unit for a wildlife species. Established by Utah Division of Wildlife Resources.

HIGH PRIORITY RANGE: That portion of the geographical area inhabited by a wildlife species that is important to the survival and perpetuation of the animal in that area.

INDIRECT EFFECT: Changes in sales, employment, or income that result from supporting industries' selling goods or services to directly affected industries or businesses.

INDUCED EFFECT: Changes in sales, employment, or income that result when employees or owners of directly or indirectly affected industries spend their income within the economy.

INFRASTRUCTURE: The basic transportation systems, utilities, services, enterprises, and other investments necessary for the operation and growth of a community.

INTERIM MANAGEMENT POLICY (IMP): The Bureau's management policy for lands under wilderness review. The policy is to continue resource use on lands under review in a manner that maintains the area's suitability for wilderness.

ION: An atom or group of atoms that carries a positive or negative electric charge as a result of having gained or lost one or more elections.

KEY MANAGEMENT SPECIES: A plant which is relatively or potentially abundant, endures moderately close grazing, and serves as an indicator of changes occurring in the vegetation complex. This species is an important component of the vegetation which, if overused, will have a significant effect on watershed, grazing capacity, and other resource values.

LICENSED USE: The authorized grazing use established by a permit issued to the livestock operator, and establishing kind of livestock, season of use, and number of animals.

LITHIC SCATTER: A site containing debris left from the manufacture, use, or maintenance of flaked stone tools.

MANAGEMENT FRAMEWORK PLAN (MFP): A land use plan for public lands that provides a set of goals, objectives, and constraints for a specific planning area. The MFP guides the development of detailed (activity) plans for the management of each resource.

MONOTYPIC STAND: An area that contains basically only one plant species to the exclusion of any other species or mix.

MULTIPLE USE MANAGEMENT: The management of the public land and its resources to allow their use in a combination to best meet the needs of the American people and ensure balanced and diverse resource use.

PEDIMENT: A broad, gently sloping bedrock surface situated at the base of a steeper slope and often covered with alluvial gravel and sand.

PHENOLOGY: The study of the timing or sequence of periodic biological phenomena, such as flowering or seeding, especially as related to climate.

PIPING EROSION: Underground erosion wherein "pipes" or conduits are formed which allow the free passage of water. It is common in soils high in sodium.

PRESCRIBED BURNING: The intentional burning of rangeland in a predetermined area under proper weather, fuel moisture, and soil moisture conditions to achieve planned benefits with the least damage and at acceptable costs.

PRIOR STABLE POPULATION: A number derived from wildlife population dynamics data using the average of 10 or more years when wildlife populations were stable and at or near the carrying capacity of the range in a given area. The numbers are established by Utah Division of Wildlife Resources.

PROPER USE FACTOR (PUF): The percent of the annual growth of a plant species an animal would prefer to eat if the rest of the range is not overgrazed; an estimate of animal forage preference.

PROPRIETOR: Owner of unincorporated enterprises.

PUBLIC LAND: Federally owned land that is administered by the BLM. It does not include Forest Service, National Park, or State lands.

RANGE CONDITION: As used in this document range condition refers to ecological condition. See definition above.

RANGE PROGRAM SUMMARY (RPS): A public disclosure document that summarizes the rangeland management decisions made following distribution of the final EIS and consultation with livestock operators.

RANGE SITE: A distinctive kind of rangeland that differs from others in its ability to produce a characteristic natural plant community.

RETAIL TRADE SECTOR: Establishments engaged in selling merchandise for personal or household consumption.

RETURN ABOVE CASH COST: Annual sales minus those costs that must be paid that same year.

RETURN ON LABOR AND INVESTMENT: Annual sales minus the cost that must be paid that same year, and the depreciation incurred on capital equipment.

RIPARIAN HABITAT: Situated on or pertaining to the bank of a river, stream, or other body of water. It includes the plants of all types that are normally associated with surface waters.

SEASON OF USE: That period of time, as designated in planning documents, within which livestock grazing can be authorized.

SERAL: Pertaining to the successional stages of biotic communities.

SERVICES SECTOR: Establishments primarily engaged in providing a variety of services for individuals and businesses.

STRATA: A collection of vegetation mapping units within a range site that are recognizable based on their similar existing vegetation.

SUITABILITY: A measure of an area's ability to be properly used for livestock grazing using four major criteria. The criteria are: distance to water, degree of slope or other physical barrier, forage production, and watershed condition.

SUSTAINED YIELD: Maintaining an annual level of production of the various renewable resources without impairing the productivity of the land and environmental values.

THIRD ORDER SOIL SURVEY: A soil survey with a level of detail about midway in the five orders. Mapping is done at a scale of 1:24,000 with minimum delineation of 6 acres. Associations, complexes, and conassociations are described and phases of series, miscellaneous land types, and occasionally family levels of soils are mapped.

TRAVEL COST TECHNIQUE: A procedure that uses the travel cost associated with various points of origin, and participation rates from those points, to estimate the economic demand (value) for a site or commodity.

TREND: (Range) The direction of change in range condition. Usually designated as improving, static, or declining.

UNGULATE: A hoofed mammal, most of which are herbivores, and many of which have horns.

UNIT RESOURCE ANALYSIS (URA): A comprehensive documentation of physical resource data for a planning unit. This system of data gathering and analysis precedes land use planning on public lands.

VEGETATION CHARACTERIZATION: A description of existing vegetation. It includes species, density, age and form classes, and composition. It may be used to measure trend.

VEGETATION COMPOSITION: The proportions of various plant species production in relation to the total in a given area, based on yearly dry weight production.

VEGETATION MANIPULATION: The altering of existing vegetation by mechanical means such as chaining, plowing, burning, or spraying, and sometimes followed by seeding with native or exotic plant species.

VISITOR DAY: Twelve visitor hours which may be aggregated continuously, intermittently, or simultaneously by one or more person(s).

WATERSHED: The total area, above a given point on a stream, which contributes water to the flow at that point. Also pertains to the collective interaction of soil, vegetation, and water in a given area.

WILDERNESS STUDY AREA (WSA): A roadless area that has been inventoried and found to have wilderness characteristics as described in Section 603 of the Federal Land Policy and Management Act of 1976 and Section 2(c) of the Wilderness Act of 1964. These areas have undergone public review and have been formally designated by the BLM State Director.

LIST OF ACRONYMS & ABBREVIATIONS

M	animal month
MP	allotment management plan
UF	allowable use factor
UM	animal unit month
LM	Bureau of Land Management
	Custodial (management category)
A	environmental assessment
IS	environmental impact statement
PA	Environmental Protection Agency
	Fahrenheit
WS	Fish and Wildlife Service
	Improve (management category)
MP	Interim Management Policy
P	linear programming
	Maintain (management category)
FP	Management Framework Plan
g/l	milligrams per litre
MOU	Memorandum of Understanding
NEPA	National Environmental Policy Act
NRDC	Natural Resource Defense Council
ORV	off-road vehicle
PRRA	Price River Resource Area
PSD	Prevention of Significant Deterioration
PUF	proper use factor
RPA	Resource Planning Act
SCS	Soil Conservation Service
SHPO	State Historic Preservation Officer
SVIM	soil-vegetation inventory method
UDWR	Utah Division of Wildlife Resources
URA	Unit Resource Analysis
USDC	U.S. Department of Agriculture, Forest Service
USGS	U.S. Department of the Interior, Geological Survey
VRM	visual resource management
WSA	wilderness study area

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March 3, 1849

United States Department of the Interior

IN REPLY REFER TO
1792
(U-060)

BUREAU OF LAND MANAGEMENT
Moab District
P. O. Box 970
Moab, Utah 84532

Dear Public Land User:

Enclosed for your review and comment is the draft environmental impact statement (EIS) prepared on the proposed grazing management program for the Price River Resource Area, including Carbon County and parts of Emery, Utah, Duchesne, and Uintah Counties. The area covered is within the Moab District of the Bureau of Land Management.

The statement was prepared pursuant to Section 102(2)(c) of the National Environmental Policy Act of 1969, and is based on information from the Bureau of Land Management and other Federal, State, and local agencies and interested private organizations and individuals. The purpose of the EIS is to disclose in advance the probable environmental impacts of the alternatives, and to provide the decisionmaker and the public with these facts prior to a decision on the grazing management program.

We would appreciate receiving your comments on the adequacy, completeness, and correctness of the Draft EIS. In order to be considered in the final EIS, your comments must be received by October 31, 1982. Oral comments may be given at a public hearing to be held October 6, 1982 at the Carbon County Courthouse, Price, Utah. Please send all written comments to:

Leon Berggren
Area Manager
Bureau of Land Management
P. O. Drawer AB
Price, Utah 84501

Please keep this Draft EIS for possible use as part of the final EIS. Council of Environmental Quality regulations provided for circulation of an abbreviated final EIS where major changes to the draft are not required. The final EIS would then consist of this Draft EIS with supplement containing public comments, responses, to comments, and necessary changes or corrections.

Sincerely yours,

District Manager

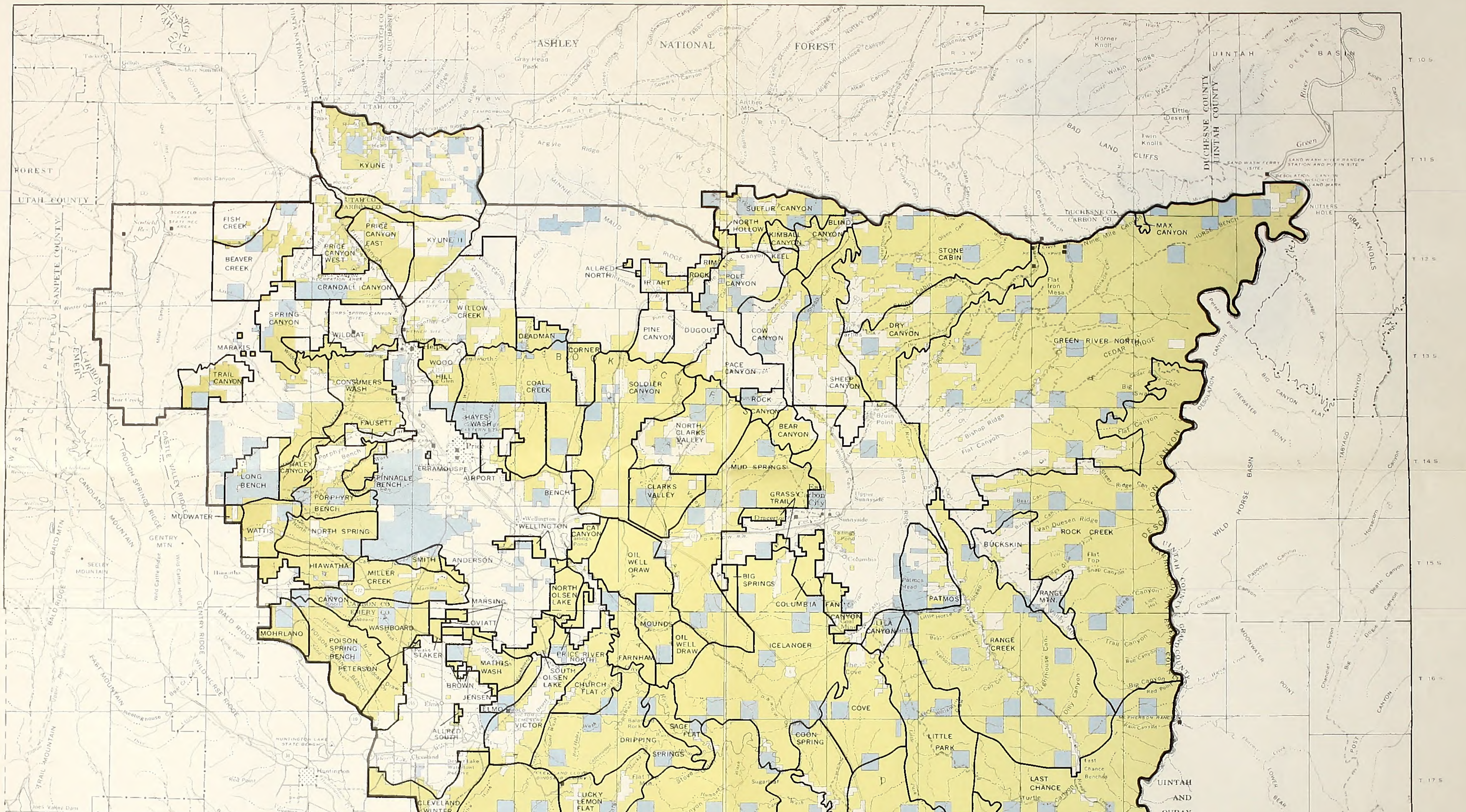

PLATE 1 LAND OWNERSHIP AND ALLOTMENT BOUNDARIES
PRICE RIVER EIS AREA

N

4 3 2 1 0 4 8
SCALE IN MILES

- 🟨 PUBLIC LAND
- 🟦 STATE LAND
- ⬜ PRIVATE LAND
- — ALLOTMENT BOUNDARY

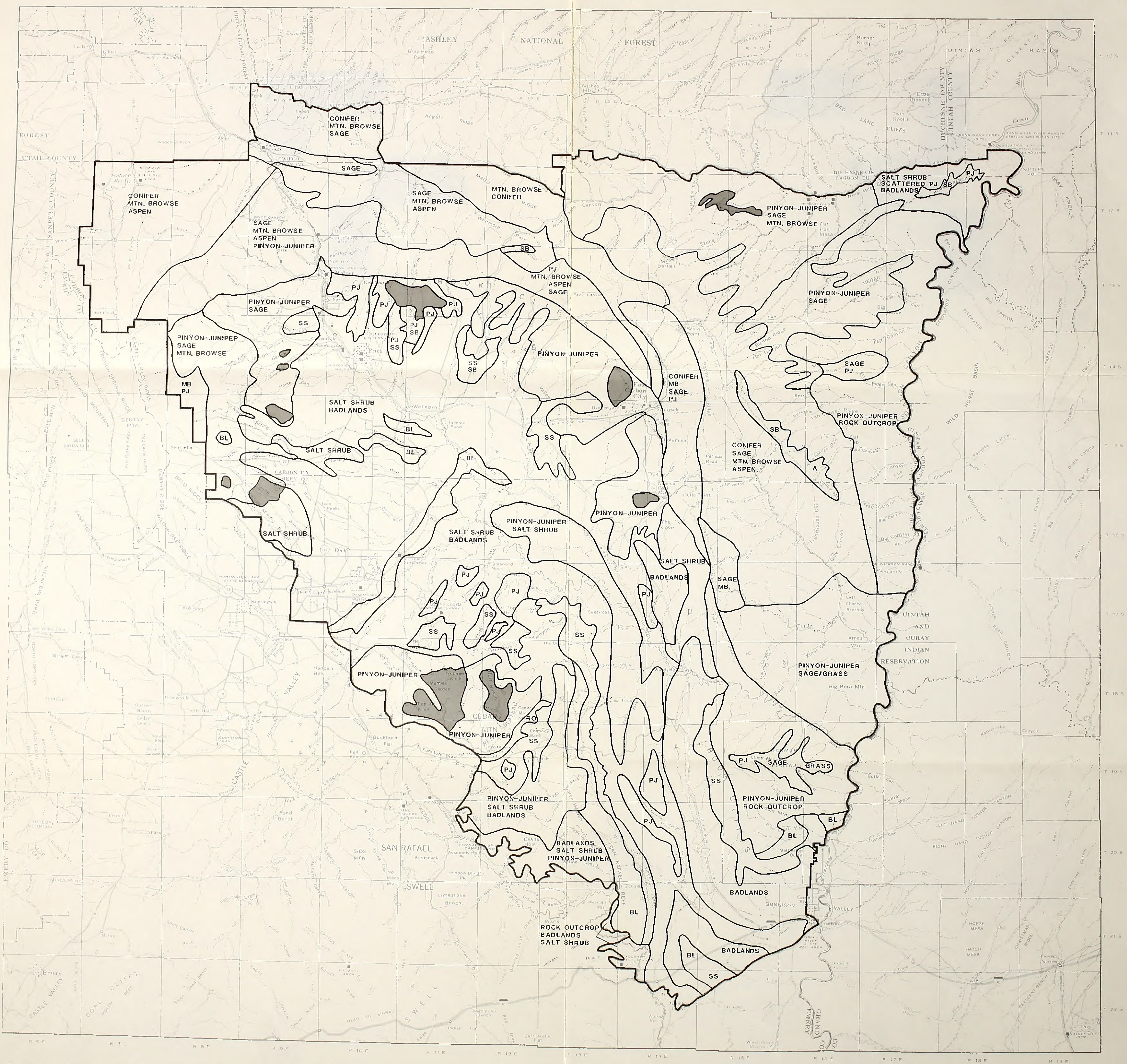

PLATE 2 VEGETATION TYPES AND EXISTING VEGETATION MANIPULATION AREAS

N

▨ VEGETATION MANIPULATION AREA

4 3 2 1 0 4 8
SCALE IN MILES

VEGETATION TYPES

SALT SHRUB	SS	SAGE	SB
PINYON-JUNIPER	PJ	ASPEN	A
BADLANDS	BL	MTN. BROWSE	MB
ROCK OUTCROP	RO	CONIFER	C

(1) Salt Shrub: Areas dominated by genus Atriplex.
(2) Conifer: Areas dominated by conifers other than Pinyon, most commonly Douglas Fir.
(3) Sage Areas dominated by genus Artemisia.
(4) Mtn. Browse: Areas dominated singly or in combination by Gambel Oak, Mountain Mahogany, Serviceberry, Snowberry, or Bitterbrush.
(5) Where more than one type is listed it indicates a composite with types listed in order of dominance.

Form 1279–3
(June 1984)

BORROWER

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Proposed grazing man
program for the Pri

DATE LOANED	BORROWER

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